



CLEAN AIR

AND ENVIRONMENTAL PROTECTION

January/February 1997

- Ambient Benzene Concentrations in Manchester
- Companies and Environmental Risk
- Developments in Environmental Telematics
- NSCA insert - Minimising Neighbour Noise

Volume 27

Number 1

NATIONAL SOCIETY FOR CLEAN AIR
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The National Society for Clean Air and Environmental Protection produces information, organises conferences and training events, and campaigns on air pollution, noise and environmental protection issues. Founded in 1899, the Society's work on smoke control led to the Clean Air Acts. More recently NSCA has been influential in developing thinking on integrated pollution control, noise legislation, and air quality management.

NSCA's membership is largely made up of organisations with a direct involvement in environmental protection: industry, local authorities, universities and colleges, professional institutions, environmental consultancies and regulatory agencies. Individual membership is also available to environmental specialists within industry, local authorities, central government, technical, academic and institutional bodies.

Members benefit from joining a unique network of individuals who share an interest in a realistic approach to environmental protection policy; from access to up-to-date and relevant information; from reduced fees at NSCA conferences and training events. They contribute to NSCA's regional and national activities; to environmental policy development; to translating policy into practice; to the Society's wide-ranging educational programmes.

NATIONAL SOCIETY FOR CLEAN AIR AND ENVIRONMENTAL PROTECTION

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EDITORIAL

Gathering the Threads of Local Environmental Quality

The Government is now putting the finishing touches to the National Air Quality Strategy in the light of comments from a range of bodies including NSCA (see this issue). With the formal establishment of a framework to meet national air quality standards by the year 2005, you might imagine that the Society is now planning for an orderly winding up of its affairs and celebrations of a job well done. Other pressure groups have had the grace to dissolve, once their campaigning objectives were achieved. But early retirement is not yet an option for three reasons.

Firstly we want to ensure that the national objectives for those air quality standards really are reached by 2005, and are not threatened beyond that date by traffic growth.

Secondly, the policies and practicalities of air quality management are in their infancy and the Society must continue to play a pivotal role in helping them reach maturity. Policies to achieve and maintain clean air must strike a bargain between social expectations, economic realities and other environmental impacts. The mechanisms for doing this - community consultation at local level, integrated policymaking at national level, positive leadership at European level - are still evolving.

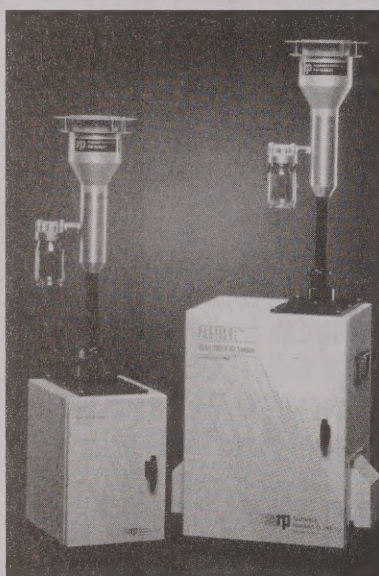
The practicalities of assessing and predicting air quality through monitoring, modelling and surrogate techniques are also developing rapidly. NSCA has been in the forefront of training in this area and now hosts a Dispersion Modellers Group which meets regularly. For local authorities anticipating their new duties under the Environmental Act, experience from the fourteen "first phase" authorities will take time to trickle through into guidance, but we hope that there will be plenty to say by next April when our Spring Workshop will focus on the realities of air quality review and assessment.

Thirdly, we have a responsibility to ensure that the solid basis for air quality management which the Society has helped to create will form a model for achieving broader environmental and social objectives. The Society's name change to encompass environmental protection reflects this. Air pollution, noise and the physical environment are important contributors to our quality of life. Improving local environmental quality should improve human health and happiness, but identifying indicators and targets which would encompass the full range of objectives will be a challenge. Hence the importance of recent initiatives which are beginning to pull these threads together. These include consultations on sustainability indicators, the National Environmental Health Action Plan, proposals to include Environment as a new key area in the Health of the Nation strategy, and the Environmental Manifesto for Local Government recently produced by the local authority associations.

Members who attended the NSCA Conference in Brighton this year will recall that the words "partnership and "integrated" popped up with such regularity in presentations that they almost became a running joke. Yet this is precisely where the Society's strength lies. Our membership gives us virtually unique access to environmental specialists across all sectors. Our capacity to build partnerships which can contribute to a truly integrated approach to sustainable development should ensure that our role in environmental protection will continue to expand for years to come.

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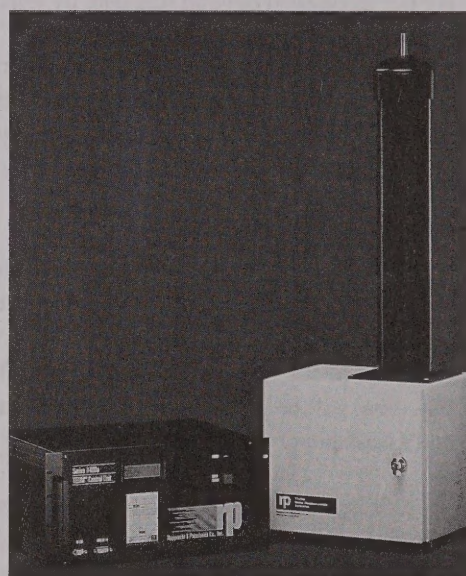
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NCSA NEWS & VIEWS

NSCA SECRETARY GENERAL

At its annual conference in Brighton in October NSCA announced that Mr. Richard Mills is to succeed Tom Crossett as Secretary General of the NSCA with effect from 1 January 1997. Richard Mills is currently head of the Air and Environment Quality Division of the Department of the Environment where he is responsible for policy on air quality, local environment quality and integrated pollution control. He is also vice-chairman of the Executive Body of the UNECE Convention on the Long Range Transport of Air Pollution. Previous posts in the DOE have covered housing - where he was head of Housing Management and Estate Action - water privatisation and regional policy.



Richard Mills

Following his retirement, Tom Crossett will continue as Director General of the International Union of Air Pollution and Environmental Protection Associations (IUAPPA); he also continues as chairman of the Southern Regional Environmental Protection Advisory Committee of the Environment Agency.

In recognition of his contribution to the development of the Society, members of the Council presented Tom with a glazed garden urn hand-thrown by Chris Lewis, a well-known potter based in Sussex.

NSCA AGM 1996

The 63rd Annual General Meeting of the Society took place in Brighton on 21 October. Dame Barbara Clayton was re-elected Chairman for a further year. Sir John Mason, Mr. Wayne David MEP and Mr. John Edmonds were re-elected vice presidents for a further three years. Dr. Derek Osborn (member of the Environment Agency and of the European Environment Agency) and NSCA's out-going Secretary-General, Tom Crossett, were elected as vice presidents of the Society - the latter appointment takes effect in January 1997.

Mr. Alan Rees, a former Chairman of the Society (1991/92) was elected Hon. Treasurer in succession to Mr. Richard Hill. As a mark of gratitude for his work on behalf of the Society, the Council presented Richard with a framed etching of a local scene.



NSCA President with Richard Hill

Honorary Members

Mr. Robert Waller (South East Division), Mr. Terry Jones (South and Mid Wales Division) and Mr. Roy Emerson (Northern Division) were elected Honorary Members of the Society. Certificates were presented to the latter two at the opening ceremony of the Society's conference (Robert Waller was unable to be present).

Robert Waller recently retired from the Department of Health and was for many years a co-opted member of NSCA's Technical Committee, and an expert on the effects

of air pollution on health. He was a member of the Medical Research Council Air Pollution Unit at Barts and on its closure in 1981 was seconded to the Department of Health. Robert Waller was also involved in the development of the WHO Air Quality Guidelines for Europe.

Terry Jones was Hon. Secretary of the South and Mid Wales Division for 17 years until earlier in 1996. He has also been a member of the Council of the Society and of its Parliamentary and Local Government Committee for many years, and was chair of the latter from 1992-95. Until March 1996, Terry was Assistant Director of Environmental Health at the former Torfaen BC, and has had a particular interest in air pollution and waste management.



Terry Jones

As a member of the NSCA's Northern Division, Roy Emerson was a staunch supporter of smoke control and, together with Laurie Mair, visited many northern councils to try to persuade them of the benefits of introducing smoke control. He became a life member of the NSCA in 1987. He was Secretary of the Teesside Clean Air Committee from 1957 to the mid-1960s and during that time presented several papers on atmospheric pollution, including presentations to the NSCA and IAPSC.



Roy Emerson with NSCA President

NSCA COUNCIL 1996/97

At the meeting of the Council held on 21 October 1996 in Brighton, Mr. Paul Cooney (Deputy Chairman of the South East Division) was elected Chairman of the Society for 1996/97. Cllr Jack Carr (Chairman, Yorkshire & Humberside Division) becomes First Deputy Chairman and Mrs Lis Solkhon (Individual Member, South East Division) Second Deputy Chairman.



Paul Cooney and George Barrett

NSCA COMMITTEE FEEDBACK

NSCA's Technical and Parliamentary and Local Government Committees have finalised the text of the Society's response* to the National Air Quality Strategy. Discussions were also held on proposals* to review the structure of the Society's Committees and Council; Divisions will be consulted on the proposed changes in the New Year. Papers* outlining the Society's plans to develop policy on transport issues, local environmental management, European good practice on air quality management and voluntary agreements with industry were also discussed. Notes of a presentation* on Clean Fuels for Clean Cars given to the European Parliament by our Secretary General Tom Crossett were approved.

The National Noise Committee is currently looking at revisions to Codes of Practice* covering Off-Road Motorcycle Sports, Oval Circuit Motor Racing and Waterskiing, and Guidance Notes* on Noise Control at Motor Sports Circuits.

NSCA is represented by Neil Turner on the DOE Industrial Pollution Liaison Committee (what used to be known as IPLA). Minutes* of the last meeting show that consideration is being given to a merger of IPLC and the central/local government working group on local air quality management. New regulations bringing petrol stations and terminals under local air pollution control came into force on 1 December, but initially apply only to new stations.

John Phipps wears the NSCA hat on a BSI committee developing test methods for air quality monitoring, including the use of diffusion tubes to monitor air pollution. If you would like to comment on the draft methods, copies are available from John at the Institute of Petroleum on 0171 467 7100.

Tim Brown represents NSCA on the Consumers Environment Forum, convened by the National Consumer Council. The Forum is currently considering a draft voluntary Code of Practice* on "green claims" for products and services.

**Further details available from NSCA on request.*

UK NATIONAL AIR QUALITY STRATEGY

The NSCA has welcomed the publication of the draft Strategy, which it considers a milestone in the development of UK air pollution control. The draft Strategy was summarised in an NSCA Briefing dated 28 August 1996, circulated with the Autumn/Winter 1996 issue of *Clean Air*.

In its response, the Society wholeheartedly supports the objective-led approach adopted and believes that overall the Strategy should provide a useful framework for the further development and implementation of policy. The Society particularly welcomes the Government's adoption of minimum health-based standards for the eight priority pollutants covered by the Strategy.

In the longer-term, however, the Society believes that the success of the Strategy will clearly depend a great deal on the detailed guidance and resources to be made available to local authorities, as well as developments at a European level. The Society is concerned that without additional national measures to tackle traffic pollution, however, the specific air quality objectives set out in the Strategy will not be met. This is one of a number of substantive issues upon which the Society feels further clarification or amendment of the draft Strategy is required.

In its response the Society recommends that the draft Strategy be amended to:

- a) provide a clear statement of the basis upon which the specific objectives were selected;
- b) set clear reduction targets for all relevant sectors;
- c) provide a clear commitment to setting ecological standards and objectives at the earliest practical opportunity (no later than the 1999 review);
- d) provide for the introduction of intermediate 'alert' thresholds and commit the Government to producing guidance for local authorities and others on immediate action to be taken during episodes;
- e) provide a framework to plan for sustainability beyond 2005;
- f) place rather greater emphasis upon the 'polluter pays' and 'precautionary' principles;
- g) provide a greater equity of measures between European, national and local measures;
- h) commit the Government to a framework of national traffic reduction targets;
- i) provide a commitment to further national measures to reduce traffic pollution, such as the introduction of clear environmentally based differentials for both fuel duty and VED;
- j) widen the availability of stop powers in relation to road-side vehicle emission testing;
- k) provide a clearer statement of what powers and resources will be available to local authorities;
- l) provide a commitment to 'top-slice' that element of the Revenue Support Grant allocated to air quality assessment and management;
- m) provide stronger links to other aspects of environmental policy, particularly the Government's waste strategy and greenhouse gas policy;
- n) clarify the remit of the National Air Quality Forum, and commit the Government to establishing a national technical coordinating body for air quality management;
- o) provide a clear statement of the aims, objectives, priorities and resources available for the Government's air quality research programme.

Copies of the Society's detailed comments on the Draft National Air Quality Strategy are available from Sally May at NSCA.

REDUCING NATIONAL EMISSIONS OF SULPHUR DIOXIDE

At the end of June 1996 the Government published its proposals for a national strategy for reducing emissions of sulphur dioxide to enable the UK to meet its commitments under the UN Economic Commission for Europe's Second Sulphur Protocol; this requires a reduction in UK sulphur dioxide emissions of 50% by 2000, 70% by 2005 and 80% by 2005, compared with 1980 levels.

NSCA welcomed the consultation paper and the proposed shift from the present system of quotas to one based upon BATNEEC. NSCA considers that projected levels of sulphur emissions are reasonable and agrees that there is no need to propose additional control measures at this time. However, the Society's response draws particular attention to:

- the urgent need to translate the BATNEEC concept into a robust regulatory tool;
- demonstrate the absence of adverse effects on the environment;
- develop improved methods for cost and benefit analysis;
- improve our understanding of critical loads for nitrogen compounds;
- implement the Integrated Pollution Prevention and Control Directive;
- reconcile the differences between the WHO guideline and the EPAQS standard for sulphur dioxide.

Copies of NSCA's detailed comments on the consultation paper are available from Sally May at NSCA.

LOCAL AIR QUALITY MANAGEMENT INFORMATION EXCHANGE NETWORK (LAQM GROUP)

Working Paper on Implementing Air Quality Management

The draft UK National Air Quality Strategy details a number of national measures which will reduce emissions from industry and road vehicles to improve air quality by the year 2005. Principal responsibility for improving air quality will, however, rest with local authorities.

In conjunction with Matthew Ireland, of the LAQM Group, the Society is embarking on a consultation exercise to compile a comprehensive list of air quality management options. This work will comprise part of Matthew's research, at the University of Greenwich, into the economic and policy implications of air quality management and will also form the basis of an NSCA Working Paper.

For the purposes of this study, air quality management options will be defined under a number of categories including:

- local, regional and national options
- single or multi-pollutant solutions
- real-time traffic management
- strategic traffic management
- public transport management
- short term and long term planning
- industrial pollution control
- change of lifestyle
- short, medium and long term solutions
- cheap or expensive solutions
- funding (capital or revenue).

This list of air quality management options will then be circulated with a questionnaire and a number of specific questions applicable to all options. These questions may include:

- Is the idea applicable to your District?
- Is the idea practicable?
- Is the idea affordable?
- How would it be funded?
- What are the commercial implications?
- Would the idea be seen as politically acceptable?
- Could the idea have effect by 2005?
- Would the effect be sufficient beyond 2005?

The NSCA would be grateful for any comments which members may have on this consultation exercise. Please forward your comments, and any suggestions for air quality management options or questions you feel should be included, to Matthew Ireland c/o the NSCA Head Office.

NSCA SUPPORTS ROAD TRAFFIC REDUCTION BILL

In July the NSCA joined the campaign for the Road Traffic Reduction Bill, writing to every local authority and MP in the country asking them to support the Bill. Current traffic levels are now widely believed to be unsustainable and emissions from road transport present the major challenge to air quality management in the UK. Road traffic is the single largest source of nitrogen oxides, carbon monoxide, hydrocarbons and black smoke. This Bill would lead directly to the drawing up of policies to provide alternatives to car use.

The Bill would set targets for the Secretary of State for Transport to reduce road traffic levels by 5% and 10% by 2005 and 2010 respectively. The Secretary of State would meet these targets by implementing a "Road Traffic Reduction Plan" which the Bill would require him to draw up. Local authorities would also be required to draw up local traffic reduction plans, although they would not be set fixed targets in recognition of the fact that traffic is more easily reduced in some areas than in others.

The response to the NSCA's mailing has been most encouraging, particularly from local authorities. Indeed, in recent months the campaign for the Bill has begun to gain real momentum, with support from:

- over 210 Members of Parliament from all Parties
- over 110 local authorities of all political persuasion
- over 50 national organisations
- over 8000 individuals who have signed up to actively campaign for the Bill
- almost 1000 locally-based community organisations.

The NSCA is presently assisting with efforts to find an MP to take forward a Private Members Bill during this session. Anyone who would like to become involved in the campaign for the Bill should contact Ron Bailey or Martin Williams of Friends of the Earth on 0171-490 1555, ext. 1414.

STOP PRESS: Liberal Democrat MP, Don Foster, who came seventh in the ballot has agreed to sponsor the Bill.

BUDGET SUBMISSIONS

Tobacco Control Alliance

NSCA joined over 50 other organisations representing national medical, health and children's charities in supporting the Tobacco Control Alliance's call for the duty on tobacco to be raised by 14p in the November 1996 budget. The submission called for similar increases on hand rolling tobacco, and on other tobacco products such as cigars and pipe tobacco to ensure that these products do not gain any price advantage over manufactured cigarettes.

The submission draws attention to the fact that each new research report shows the risks to health from smoking to be even more serious than had been previously thought;

a 1994 report in the *British Medical Journal* suggests that around 50% of all regular smokers will be killed by their smoking. It is also predicted that between four and five million children in the UK will become regular smokers and that of these around one million will die from smoking induced diseases in middle-age; a further one million will die in later age (but prematurely compared with non-smokers) as a result of their smoking.

Transport Action Roundtable (TAR)

NSCA joined other members of TAR (which is convened by Transport 2000) in writing to the Chancellor to recommend changes in taxation affecting transport. TAR's recommendations include:

- the benefit charge for the private use of a company car should be determined by the amount of private, not business, use; also the lower business mileage break point should be raised from 2,500 to 5,000 miles and there should be changes to the scale charges for free fuel, which should be raised for all but the lowest band (below 1400 cc) of petrol cars;
- road fuel duties should be increased at least 5% in real terms;
- premium business rates should be levied on car parking spaces; a "rates holiday" of say, 5 years, for car parking space converted to office, retail or other non-parking use with a fast-track planning procedure for such conversions;
- air passenger duty, except for UK flights (currently £5), should be increased to £10 (from £5) for flights to other EC countries and to £20 (from £10) for flights elsewhere.

REPORTS

Ambient Benzene Concentrations in Manchester

J.D. Drabble¹ and K. Hodgson²

¹Scientific Officer, Environmental Health Division, Manchester City Council

²Lecturer, Faculty of the Environment, Salford University

A survey of ambient benzene concentrations in Manchester for the full year of 1995 is reported and the results are compared to the proposed air quality standard for benzene. The figures correlate well with other UK studies, showing that there are elevated benzene levels at petrol filling station forecourts, and that at such locations the proposed standard of 5 ppb running annual mean may be exceeded.

The discussion reviews the justification for the proposed standard on the basis of predicted health effects from extrapolated exposure data. It concludes that a lower (target) standard of 1 ppb should be implemented if the precautionary principle is employed, due to uncertainty as to whether a threshold for adverse health effects exists.

Introduction

A study of ambient benzene concentrations in Manchester commenced in 1994, to assess airborne levels at various locations in the city. The same year had seen the publication of proposals for an Air Quality Standard (AQS) for benzene by the Expert Panel on Air Quality Standards (EPAQS) (DoE, 1994), and at that time the issue of benzene levels in urban environments in particular was very much to the fore. A link between benzene exposure in the workplace and certain types of leukaemia has long been established (World Health Organisation, 1983), and the association was now being suggested for levels of benzene several orders of magnitude lower, at those typically found in urban air.

To compound the uncertainty presented by such extrapolation of toxicological data, there has been a variety of figures put forward as to the actual aromatic content of the various grades of fuel sold in the UK, and as to the significance of any differences which the petroleum industry have conceded (UK Petroleum Industry Association, 1995, and Environmental Data Services, 1994a). The European Auto/Oil Programme's proposals include a reduction of the maximum level of benzene in petrol from 5 to 2% by 2000, although most petrol sold in the UK presently contains only 2-3%. However, the benzene proportion in the vapour phase is less, typically 1-2% (Coker *et al.*, 1989).

Benzene is also formed under the combustion conditions in vehicle engines, either by thermal degradation of higher aromatics or trimerisation of ethylene; 60-65% of benzene in vehicle exhausts is emitted via these reactions (Royal Commission on Environmental Pollution, 1994).

Evaporative losses from petrol distribution systems and service stations are now being brought under the control of local authorities via the authorisation system within Part I of the Environmental Protection Act 1990, under the Stage I EC Petrol Vapour Recovery Directive (94/63/EC). The 'Consolidated Emissions' Directive (91/441/EEC) effected the fitting of 3-way catalytic converters to vehicles, and more stringent limits from 1996 (1997 for existing vehicles) have since been introduced under Directive 94/12/EC.

There is therefore a dual control mechanism of limiting benzene at source in the petrol, and reducing both endogenous and by-product hydrocarbon releases from the exhaust. The EPAQS' AQS of 5 ppb as a running annual average concentration was adopted in the recent Draft National Air Quality Strategy, (DoE, 1996), but the Panel's further recommendation that this be reduced to 1 ppb would require 'additional policies' to address deterioration of catalytic converter performance with age, and uncontrolled petrol vapour releases from distribution and refuelling.

Against this background of legislative and political developments, the results of benzene monitoring undertaken in Manchester for the full year of 1995 are reported, in order that a comparison against the proposed annual standard, and preliminary judgements as to the implied health effects on the population of Manchester, can be made.

Methodology

The Draft Strategy document states that there is no intention to significantly expand the current (12-site) national automatic hydrocarbon monitoring network, although future affiliation of local authority sites will be considered, and research into alternative methods will

continue. The strategy does accept that non-automatic sampling is useful for screening, to identify locations where 'more sophisticated monitoring may be necessary'.

Techniques which employ discrete long-term sampling periods, of the order of two weeks, enable an annual mean to be calculated, and given a comparable validation of the methodology this mean value will be very close to that generated by continuous monitoring. Clearly the 'rolling' mean can only be updated on a fortnightly rather than an hourly basis but, as there is no percentile to be calculated for compliance, hourly values would not be required. The difference in the capital cost of the hydrocarbon analyser compared to the analytical costs of periodic sampling (approximately £6k pa for this survey, as opposed to circa £25k for BTX or £60k for the 27-species 'Vocair' system) justify the potential loss of short-term peak concentration data.

Commercially-available passive hydrocarbon diffusion monitors were originally developed to measure workplace atmospheres with concentrations in the parts-per-million range. The refinement of the technique to measure ambient levels in the parts-per-billion range has sought to achieve the lower detection limit by extended sampling periods, whilst balancing problems of analytical interferences at low concentrations, component uptake and back-diffusion. Various collection media have been validated for diffusive hydrocarbon sampling, such as charcoal (Purdham *et al*, 1994), Tenax (Health and Safety Executive, 1985), and Chromosorb 106 (CONCAWE, 1994a; Downing, Campbell and Bailey, 1994).

This survey used SKC 575-001 charcoal passive samplers, validated for personal monitoring to NIOSH

protocol Level 5 for benzene sampling up to 8 hours. Fortnightly exposure periods were chosen, such that the solvent desorption and gas chromatographic analytical technique gave a detection limit of 0.6 µg/m³ (0.2ppb).

The diffusion monitors were sheltered from direct rainfall but were otherwise fixed in free field locations with minimal airflow disturbances. A range of site locations was selected, as the study was intended as a preliminary appraisal across areas with differing characteristics to inform any subsequent survey strategy review. The 9 site locations were classified as semi-rural, urban background, roadside or petrol service stations, and are described in Table 1 below.

Results

A summary of the 1995 survey is given in Table 2, and the annual mean values for the nine sites are plotted in Figure 1.

The results are in the rank order expected, petrol service station forecourts showing the highest annual mean benzene concentrations above (in descending order) city centre roadside, motorway, urban background and semi-rural locations. None of the sites exceeded the proposed AQS of 5 ppb annual mean, although at service station 2, 40% of the two-weekly average results were above this value and it is therefore possible that future rolling means covering different 12-month periods may exceed the standard.

It is also notable that the city centre roadside location exceeded the EPAQS target AQS of 1 ppb running annual average, and at the motorway slip road the annual average of 0.9 ppb was only marginally below this value, with 48% of the two-weekly averages above it.

Table 1: Description of Site Locations used in the Study

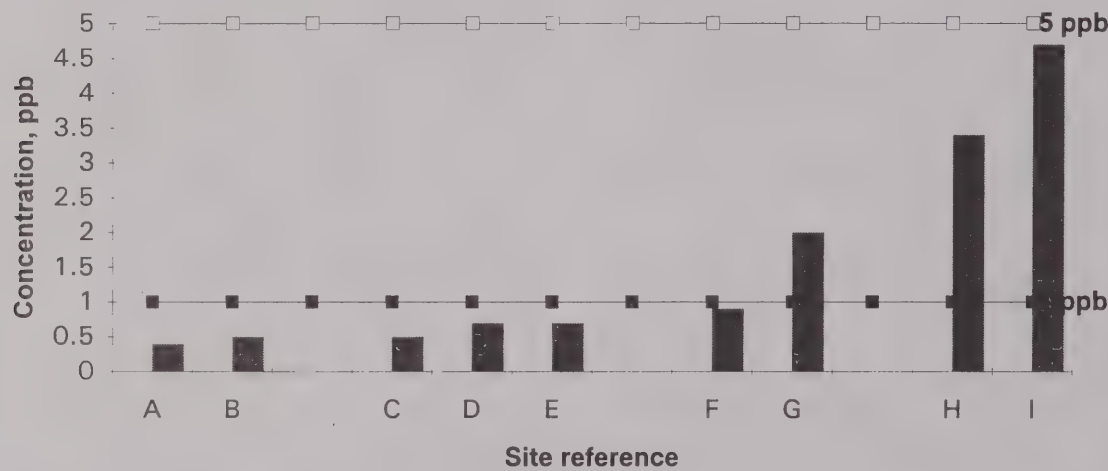
Site Ref.	Classification	Description of Location
A	semi-rural	Suburban residential location, 9 miles south of the city centre, 50 metres from the nearest road
B	semi-rural	Farm centre within large park, 3 miles north of the city centre, 700 metres from the nearest road
C	urban background	Secondary school grounds, south of the city, 100 metres from 4-lane motorway (site F)
D	urban background	Large chemical manufacturing site, north of the city, 50 metres from busy single-carriageway road
E	urban background	City centre gardens area, bus terminus, 50 metres from car and commercial trafficked road
F	roadside	On hard shoulder of 4-lane motorway acceleration slip road
G	roadside	Congested one-way, 4-lane city centre road
H	petrol service station 1	Located above an unleaded petrol delivery pump in busy service station forecourt
I	petrol service station 2	Located above an unleaded petrol delivery pump in busy service station forecourt

Table 2: Summary of 1995 Data of Ambient Benzene Levels in Manchester

Site Ref.	Classification	Annual Mean, ppb	Range ppb	No. of 2-weekly averages* >5 ppb	(%)	No. of 2-weekly averages* >1 ppb	(%)
A	semi-rural	0.4	<0.2 - 0.8	0/21	(0)	0/21	(0)
B	semi-rural	0.5	<0.2 - 1.0	0/23	(0)	2/23	(9)
C	urban background	0.5	<0.2 - 1.2	0/24	(0)	2/24	(8)
D	urban background	0.7	<0.2 - 1.5	0/25	(0)	3/25	(12)
E	urban background	0.7	0.2 - 1.5	0/25	(0)	5/25	(20)
F	roadside (motorway)	0.9	0.2 - 1.6	0/25	(0)	12/25	(48)
G	roadside (city centre)	2.0	0.8 - 2.7	0/24	(0)	23/24	(98)
H	petrol service station 1	3.4	1.2 - 5.6	2/20	(10)	20/20	(100)
I	petrol service station 2	4.7	2.0 - 7.7	10/25	(40)	25/25	(100)

* One 4-week exposure period, therefore the maximum number of exposure periods = 25

Figure 1: Ambient Benzene Concentrations in Manchester, 1995



The non-service station results generally compare well with other available ambient benzene data for urban areas in the UK (Information for Industry Ltd, 1996a), with no exceedences of the proposed annual mean AQS of 5 ppb, but frequent periodic and annual average exceedences of the proposed 1 ppb target AQS. Higher values have been found in Cardiff, Sheffield and Coventry, but these data were collected at elevated locations using the OPSIS open-path spectrometers, which may not give directly comparable data (Environmental Data Services Ltd, 1994b).

A survey conducted by the Warren Spring Laboratory in 1992 covered 59 UK sites over a 6 month period, and the results gave an overall mean for all sites of 1.0 ppb, with a range of 0.4-2.2 ppb, (Downing, Campbell and Bailey, 1994).

Diffusion tube monitoring undertaken in several London boroughs in 1993 did, however, indicate that over a quarter of the 20 'background' sites in the survey exceeded the proposed 5 ppb standard (Environmental Data Services Ltd, 1994c). This may reflect the selection of more roadside sites than the Manchester study, or it is a further confirmation of the poor air quality in London compared to other major cities in the UK.

The petrol station forecourt results were consistently higher than those from the other sites, with 40% of the two-weekly average exposure periods at station 2, and 10% of those at station 1, in excess of 5 ppb. Other similar studies have reported forecourt mean benzene concentrations of 6.4 ppb (CONCAWE, 1994) and 7.8 ppb (Little and Cram, 1995), although these results were averaged over 24 and 48 hours respectively, and lower values when averaged over a full year are not unexpected.

Discussion

EPAQS derived its proposal from occupational exposure data and the application of non-workplace factors, but the Panel conceded that assumptions were made in this derivation. 'There are no useful available data on the effects in humans on the exposure to the low benzene concentrations found in the ambient air', and there is doubt as to the accuracy of some workplace exposure estimates reported. The critical effect is taken to be acute myeloid leukaemia (AML), which is strongly linked with benzene exposure but which is relatively uncommon even in exposed workers, such that statistically-significant conclusions require large study populations. The genotoxic activity is concluded from animal studies, and the understanding of the mechanism of causation of non-lymphatic leukaemias is not complete.

CONCAWE recently undertook an extensive review of the data on the health effects of benzene exposure (CONCAWE, 1995), and concluded with a scientifically-based AQS of **30 ppb**. The adjustments made to the derived No Observed Adverse Effect Level (NOAEL) (4.2 ppb for 1.3 years) were more detailed than those made by EPAQS to its equivalent baseline, with corrections for obesity, child growth effects, racial group metabolism differences and general population target organ dynamics.

However, the report is appended with a discussion on the incorporation of 'risk management principles' and the consideration of three factors which 'do not lend themselves to *scientific* debate'. When taken into account, these factors, namely data quality, residual uncertainty and socio-political considerations, cause the 30 ppb scientifically-based value to be 'bounded by values of 5 ppb and 50 ppb'. These risk management factors are essential considerations in the derivation of a national AQS for the protection of public health, and the resulting lower boundary is seen to correlate with the EPAQS derived value.

A major study by the Institute of Petroleum found only a tentative link between leukaemia incidence and exposure to low benzene concentrations in oil distribution workers. The conclusion from research covering 23,000 employees was that the link between AML and benzene exposure below 45 ppm years was uncertain because of the wide confidence intervals in the results (Rushton, 1995). The CONCAWE report argues further that there are in-built defence mechanisms which means the application of a 'no-threshold' extrapolation 'over-estimates the severity of any health hazard linked with exposures to very low concentrations of benzene'.

However, a defence of the application of the lowest practicable AQS can be argued by returning to the consideration of ambient sampling methodologies. Both the continuous hydrocarbon analyser and diffusion sampler

methods measure benzene only in the vapour phase. A confounding factor which has not been addressed when considering exposure to benzene in urban air is that volatile organic material can be adsorbed onto the surfaces of carbonaceous particulate matter.

The volatile components of particles are more prevalent in the small size range, typically PM_{2.5} as opposed to PM₁₀, on which most attention in the UK is being focused (Meyer M.B, Rupprecht E. and Patashnick H., 1995).

In the system used in the national hydrocarbon monitoring network, the sample airstream is first passed through a filter to *remove* particulate prior to gas analysis. Diffusive samplers similarly sample only organic compounds in the vapour or gaseous phase, (other than possible chance particle impaction through the perforated protective sampling face). The latest developments for continuous particulate analysers are looking to quantify the 'volatile' carbonaceous fraction and the residual 'inorganic' (sooty) carbon particles separately, and it may be that such work will demonstrate that by sampling only vapour phase organics to date, exposures to benzene in terms of absorbed dose through the lung have been significantly underestimated.

The epidemiologists, toxicologists, representatives of the oil companies and now the environmental analytical chemists have all cast doubt onto the health implications of low level exposure to benzene in the urban environment. The UK Strategy has adopted as one of its policies the Maastricht Treaty's Precautionary Principle, to err on the side of safety where knowledge is incomplete, and so the EPAQS proposal for a target AQS of 1 ppb should be implemented in the 1999 review.

Summary

This first year study of ambient benzene levels in Manchester indicates that a proposed annual running mean AQS of 5 ppb might be met at locations other than petrol filling stations, but that the possible target of 1 ppb is not being achieved under existing circumstances.

Given the lack of firm evidence against adverse health effects arising at low level benzene exposures, the precautionary approach should be adopted, and the EPAQS target AQS should be implemented. Only this, and more stringent outcomes of the Auto/Oil II Programme, will provide the stimulus for the oil companies to further their research into alternative fuel and vehicle technology.

Compliance with the benzene AQS which has been set will need to be demonstrated in the more immediate term via local authority air quality appraisals, either by more extensive monitoring or through estimations from NO_x and CO data correlation. As a significant expansion of the national continuous hydrocarbon monitoring network is unlikely, the guidance accompanying the Strategy should

make allowances for validated passive diffusion sampling results to contribute to air quality data. The promised research should also consider quantification of volatile organics adsorbed onto particulate surfaces for a better estimation of personal exposures. The collation of as much valid evidence as possible at a local level will be particularly important given the Government's assertion that the benzene AQS will be met with existing policies, even at roadside locations, by 2005.

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Companies and Environmental Risk

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What is Environmental Risk?

Environmental risk, like all other types of risk, relates to the likelihood of an adverse result occurring. In environmental terms this generally requires three things: the incidence of a hazard, the existence of a vulnerable target, and a pathway between hazard and target. Management of environmental risks is possible if the company has reliable information available about all these things. As far as companies are concerned, the risk of environmental liabilities and costs can include:

- legal and other professional fees
- third party claims
- effect on value of assets
- effect on the reputation/“brand value” of the company.

It is perhaps the last two of these risks which are the most difficult to quantify.

Why are Environmental Risks Special?

There are a number of reasons why environmental risks are regarded as being in some way special, or different in nature from other types of risk. Essentially this comes down to their uncertainty and their scale. Environmental issues are rarely black and white, and scientific knowledge is seldom such as to give rise to total certainty. Uncertainty can also arise from the fact that as knowledge and awareness increases, what may have constituted good practice in the past may in future be categorised as harmful, even if responsible behaviour at the time. The issue of regulatory risk is also significant: not only may the stringency of legislation change but also the stringency with which legislation is enforced thereby factoring in further uncertainty. The crystallisation of liabilities can sometimes occur over much longer timescales than other kinds of risk.

With regard to the scale of risk, experience suggests when certain environmental risks do crystallise, they can do so in a big way - as industry and insurers have found to their cost in the US, for example. Another aspect of the scale of environmental risk is that it may bear no relation to the size or value of an asset which is affected by, or gives rise, to the risk.

How Should Environmental Risk be Managed?

Management of an environmental risk involves identifying that risk, quantifying it and acting accordingly. Whilst it is frequently said that what cannot be measured cannot be managed, this may well be misleading in relation to

environmental risk. Many environmental risks cannot be measured accurately - indeed, given the changes which may occur in risk perception or in regulation, it may be difficult to know what a company should measure for. This should not, however, prevent a company seeking to identify and to manage environmental risks.

Voluntary versus Mandatory Reporting

In November 1994 at a seminar sponsored by the Advisory Committee on Business and the Environment (ACBE), John Gummer, Secretary of State for the Environment, urged businesses to move forward voluntarily with environmental reporting “so far as is humanly possible”. He was reported as saying that “the option of business as usual” was simply not available, and expressed the hope that by the end of 1995 business and the City would have created a situation in which environmental management was seen as a key part of any firm’s management programme. He was also reported as saying that if this did not occur then the Government would if necessary intervene.

Whilst very little change in attitudes towards environmental reporting has occurred since November 1994, it appears that the Government has no intention of making such reporting mandatory. The current approach is that environmental reporting should remain on a voluntary basis only, and that the Government would be unwilling to countenance tightening rules on accounting for environmental liabilities unless this was absolutely necessary. However, it may be that a future government might have a different approach to this issue.

The current position in the UK contrasts starkly with the position in the US where tough reporting arrangements are enforced by the Securities and Exchange Commission, which liaises closely with the relevant environment protection agencies.

Whilst the Government wishes to keep green reporting on a voluntary basis, it certainly sees reporting as having an important role to play in supplementing (indeed partially superseding) some aspects of traditional regulatory control.

With a few notable exceptions, most companies continue to display a high degree of indifference towards environmental reporting. Very few companies engage in such reporting even amongst the top tier FT-SE 100 companies, let alone amongst small and medium sized enterprises. This raises the question as to what the barriers to reporting are.

Barriers to Reporting

There are a number of reasons why companies may be hostile towards environmental reporting, quite apart from any possible relationship with the quality of management within the company generally. For example, these include:

- many companies regard environmental reporting as a highly uncertain, subjective and mysterious exercise;
- there is a concern amongst some companies that investigation and reporting may in fact crystallise liabilities, or may result in expensive investigation or clean up requirements being incurred;
- there is a concern about being amongst the frontrunners to engage in environmental reporting, and whether this may lead to competitive disadvantage;
- there is also concern that because of the lack of any clear standards or ground rules for reporting, information given may be misconstrued or misused by the public or media;
- there is scepticism as to whether the provision of environmental information is in fact a positive "selling point" for a company.

Many companies therefore take the view that whilst they may operate sophisticated environmental management systems internally, there is no reason as yet to expose those systems or the results they produce to the public gaze. Many more companies of course do not operate environmental management systems at all.

Does the City Care?

If the Government is not to introduce mandatory requirements for environmental reporting, then pressure to report is only likely to come from financial institutions, analysts or investors. The Advisory Committee on Business and Environment recommended, in 1994, that environmental reporting and disclosure should be made requirements of Stock Exchange listing particulars, but the Stock Exchange did not apparently see this as its role. Any such requirements are likely to be driven ultimately by investor demand, which appears to be lacking at present. A report published by Business in the Environment in 1994 suggests that most City analysts ignore environmental pressures on companies because they cannot price the impact. Three-quarters of the City analysts surveyed in the study did not see the environment as a competitive issue within the business sectors which they cover, though most felt that the environment will become more important over the next few years. It may be that the lack of interest is to some extent at least a reflection of the inadequacy and lack of informativeness of some reports, and the lack of any clear standards regarding their content and what constitutes good environmental performance in that industry.

The Role of the Banks

It is clear that the attitude of banks to environmental risk varies enormously. Whilst due diligence in the context of a particular transaction or project is becoming increasingly common, attitudes are only changing slowly and there is clearly a need for a major educational programme. This situation is not helped by the perception that banks which impose stringent environmental investigation requirements on their customers may lose business to competitors with lesser requirements.

Insurance

The perception is that insurance is largely irrelevant to environmental risk, particularly because of the high "fear of the unknown" factor on the part of insurers in relation to this type of problem. By self insuring at least in part, and by having in place an effective environmental management system, coupled with an attitude of openness towards insurers, some companies have been able to make progress in environmental coverage and indeed in the reduction of premium levels. Again, more information is needed as to how insurers respond to efforts by companies to control environmental risk. The UK Loss Prevention Council, for example, has recently commissioned a three-year study on the Response of the Insurance Industry to Development in Environmental Management Systems.

Valuation of Assets

It is clear that environmental liabilities represent an area of great difficulty in relation to the valuation of assets. One example given was the phase-out of ozone depleting substances under the Montreal Protocol which shortened the life of CFC production plants, thereby reducing their value as fixed assets.

The surveying profession is now beginning to come to terms with environmental liabilities, particularly in the revision to its surveying practice manual, the Red Book, which took effect on 1 January 1996.

There is still great confusion as to the basis of valuation, and to what extent potential clean up requirements may be relevant at all, for example in the case of an industrial facility which has operated for many years on the same site and remains in industrial use.

Accountancy Standards

In accountancy terms environmental liabilities are not fundamentally different to other types of liability, but are problematic in that they are often not clearly defined. Problems can arise as to what triggers environmental liability. This may be a legal obligation, or it may be a decision by management to expend money on clean up: this latter aspect is itself problematic, since the decision can equally well be categorised as a decision to invest rather than a "liability". There is also the separate issue of quantification of liabilities, which may be extremely difficult.

MINIMISING NEIGHBOUR NOISE

nsca

All of us are sometimes bothered by noise - usually other people's noise. It can annoy us, irritate us, disturb our peace and quiet and our sleep. Noise can cause problems depending on loudness, how long it lasts, how often it occurs, when it happens or whether it is high or low pitched. All of us often make noise which affects others, and a lot of this noise can be avoided.

The whereabouts of our neighbours is important. People living adjacent, above or below can be more affected because of party walls, floors and ceilings, than by neighbours in detached houses. Even basic precautions such as closing your doors and windows (quietly) can reduce noise levels significantly.

Below is a list of simple measures you can take to help you to avoid causing noise disturbance to your neighbours.

Radios, TVs, Stereos

- Keep the volume as low as possible, especially late at night. Use headphones (either cord type or infra red which give more freedom of movement), or listen to music on a personal stereo.
- When not using headphones or an earpiece the bass control should be set at a low level as the "bass beat" can be particularly irritating.



Use of Domestic Appliances

- Site fridges, freezers, washing machines and loudspeakers well away from party walls.
- Stand washing machines/spin dryers on a solid floor or place on a carpet/rubber mat to reduce vibration.
- Do noisy jobs or operate noisy equipment such as washing machines and vacuum cleaners during the day.
- Mow the lawn and use garden power tools at a reasonable time - not early morning or late evening.
- Noise can travel through walls and floors.
 - If people live below you, fit carpets and underlay.
 - Avoid fitting speakers to party walls.
 - Close doors gently, don't slam them.

Household Repairs and Improvements

- Carry out noisier operations during the day keeping the evening for less noisy work such as painting and decorating.
- Don't leave DIY equipment running - switch it off when not immediately required. Hired equipment, eg mixers, generators are often more powerful than DIY versions and can cause more noise problems. These therefore require more care and consideration in use.
- Complete the work as quickly as possible - don't let it drag on for months.
- Let your neighbours know beforehand if you are carrying out potentially noisy operations, using power equipment or working on party walls or floors. Use hand tools if possible.



Cars

- Don't rev the engine excessively.
- Close doors quietly.
- Use car horn only for emergencies.
- Keep music levels down, keep windows closed.
- Drive quietly in built up areas - don't drive/brake fiercely.

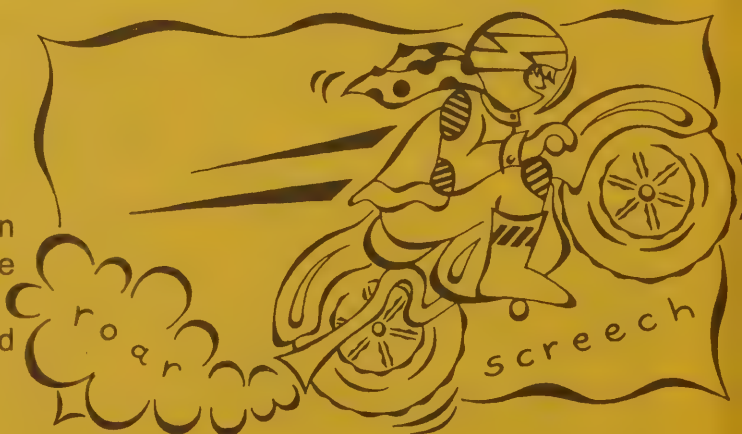
Repairs

- If possible carry out work in a garage.
- Carry out necessary noisy operations during the day and avoid Sundays.
- Don't rev the engine for long periods.
- Don't repair anyone else's car.



Motorcycles

- Don't speed around streets in groups.
- Don't ride on open spaces near houses - in some areas special tracks are provided, use these instead.
- Keep the machine properly silenced and don't rev the engine or drive/brake fiercely.



Dogs

- Don't let your dog bark or whine for long periods or leave it alone.
- Keep your dog indoors if it barks constantly when unattended or disturbed. If your dog still barks when indoors make arrangements to leave it with a neighbour or friend or get someone to call in - leave its favourite toy or put the radio on at very low volume.
- 'Constant Barking Can be Avoided' available from the Department of the Environment Tel: 0171 276 3000 gives further tips on keeping dogs quiet.



Musical Instruments

- If you play a musical instrument do not practice early in the morning or during the late evening/night.
- If the instrument has an amplifier turn the volume down or preferably use personal headphones.

Late Night Revellers

- If you are having a party or barbecue, remember the neighbours - let them know beforehand or better still invite them.
- Keep the music turned down low.
- Go home quietly.
- Do not stand around in groups outside pubs, clubs or in residential areas.



Outside Noise

- If you are playing music try to keep it at a level that cannot be heard outside your own land.
- If children are playing outside, ensure they do not cause excessive disturbance, especially by throwing/kicking balls against the walls of neighbouring properties.
- If you have a marquee, remember that the material is very light and will not prevent noise escaping.



In General

- When buying/hiring domestic appliances or DIY equipment buy the quietest equipment available - look for information about noise levels on labels.
- People (particularly the elderly and children) need a rest from noise - especially during the evening and at weekends. We suggest that unavoidable noisy activities are carried out between
8.00 am - 7.00 pm weekdays and Saturday
10.00 am - 5.00 pm Sundays



For help and advice dealing with noise problems contact the Environmental Health Department at your local authority. There may also be a mediation service in your area who can assist in resolving neighbour disputes - Mediation UK Tel: 0117 924 1234 - can provide information.



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Whilst current accounting standards have the potential to provide guidance on environmental issues, there is felt to be generally a lack of sufficiently clear guidance, and considerable work is being done in this area.

It is clear that environmental issues can be treated in various different ways in accounts and in reports. An obvious distinction is between direct financial provision as against disclosure; this will depend on the degree of information available. Another issue is that the forum for environmental reporting can be different. It may occur in the annual company accounts, or in the directors' report, or in a stand alone environment report. All of these will be directed at different audiences which may include employees, investors, the media, regulators and the public. The common factor is that there should be co-ordination between the three media and in each case there should be the maximum possible transparency.

The Cross-Disciplinary Problem

Another problem which emerges is that of lack of understanding as between different specialists. There is presently a lack of experience on the part of accountants generally in reading and interpreting environmental reports. The same is probably still true of the valuation profession. Only time and growing experience will remedy this problem, coupled with adequate opportunities for interdisciplinary dialogue.

The Perception Dimension

The fact that environmental reports can be addressed to very different audiences has been referred to above. One major potential problem is the concern by companies as to how environmental information will be perceived and treated by environmental groups, the media and the public generally. There is a concern that lack of understanding of issues of risk may lead to information being taken out of context, and to over-sensationalised reporting.

Risk Rating

One issue which has aroused recent interest is that of risk rating techniques. Environmental risk rating may involve identifying the risks inherent in a business and categorising these as high, medium or low risk. The process can be beneficial, forcing management to identify and face up to risks, and find ways of reducing risk. However, the actual process of comparative rating of risks remains relatively crude, and is a process which in relation to any one company is likely to take several years of work. It may be extremely difficult to identify consistent industry criteria, or to establish what are typical or acceptable degrees of risk within a particular industry. There is also the risk of confusion with established credit rating systems, which may or may not take account of environmental risk to varying degrees.

Another issue is that risks may exist in relation to a number of sites within a company and may exist over a period of years. There is therefore a need for an actuarial approach to identify what may be a flow of liabilities, coupled with the recognition that the risks are unlikely to crystallise in relation to all sites or assets at the same time.

Another aspect of risk rating relates to one off or abnormal escapes, which should involve consideration as to how well a company is prepared in terms of its crisis management plans and programmes to deal with such events.

Environmental Management Systems

Such systems provide a context within which environmental risk can be identified, assessed, and managed; though they are designed to fulfill wider purposes than simply the control of liabilities. Work within the British Standards Institute and the European Community has resulted, respectively, in BS 7750 and EC Regulation 1836/93 on an environmental management and audit scheme (EMAS). Internationally, a third standard, ISO 14001, has recently been finalised and was published in September 1996.

There is no necessary correlation between environmental management and environmental reporting, though the EMAS system does contain certain requirements in that respect. The implementation of an effective management system (whether or not within one of these formal frameworks) will inevitably facilitate environmental risk management and will provide more comprehensive and reliable data which may be the subject of environmental reporting.

Companies are currently faced with the possibility of utilising the British Standard BS 7750, following the requirements of EC Regulation 1836/93 (EMAS) in monitoring their potential environmental impacts or adopting the international standard ISO 14001.

BS 7750 vs EMAS

In February 1996, the European Commission recognised that organisations certified in compliance with the BS 7750 can also be considered as meeting the requirements of EMAS, although the latter contains extra requirements which must also be met (see Table). Both BS 7750 and EMAS require companies to publish their environmental objectives, to consider and compile a register of the company's effect on the environment (including its past, present and future activities and those of its contractors), to prepare an initial environmental review of environmental issues and to commit themselves to a scheme (although this is voluntary under EMAS) of continuous improvement of environmental impacts to levels not exceeding economically viable applications of best available technology (EVABAT). Essentially EMAS differs from BS 7750 in that EMAS applies to each site of an

organisation, requires an environmental review and audit to be carried out at each site and an environmental statement to be prepared and examined by an independent verifier, whereas BS 7750 only requires the publication of an environmental policy.

ISO 14001 vs BS 7750

Although recognised as being less stringent in certain areas, ISO 14001 has the same basic objectives as BS 7750. The differences are that ISO 14001 does not require organisations to account for past historic effects on their sites and does not require their objectives to be made public (the latter therefore preventing direct comparisons of an organisation’s improvement programme).

Local Authorities

Building on BS 7750 the UK Government, supported by the local authority associations and the Local Government Management Board (LGMB), has pioneered the local authority EMAS (LA-EMAS) which has been adapted from the EC scheme for industry. Although, at present, only the London Borough of Sutton and Hereford City Council have registered under the scheme, local authorities are encouraged to participate on a voluntary basis and the LGMB expected around another six or so authorities to register by the end of 1996.

By adopting LA-EMAS, a local authority should be able to ensure that environmental issues and their management are integrated into different policy and service areas. The principle of good environmental management that is behind EMAS should bring about cost and service benefits and an independently verified environmental statement unequivocally spelling out the level of commitment an authority is undertaking.

Conclusion

As the importance of environmental issues increases across the world, it is likely that businesses will need to be seen to have satisfactory environmental profiles in order to remain internationally competitive. Compliance with, or accreditation to, environmental management systems such as EMAS in EC member states, and ISO 14001 internationally, may become an essential component of competitive enterprises. Each standard provides a mechanism for improving the environmental performance of a participating company and documenting such improvements.

It is clear that in terms of environmental risk, companies are currently in something of a transitional period, moving towards more sophisticated risk management and reporting techniques. However, because of the lack of such techniques in the past there is potentially a “backlog of risk” which needs to be worked through the system: it is this which is in some cases presenting barriers to full and frank investigation and reporting.

What is also clear is that the search for certainty, in terms of numerical risk ratings or monetary quantification of risk, may be elusive. In any event, there is little research or hard evidence as to how such issues will ultimately affect businesses. What is clear is that the very process of seeking to identify, assess, manage and report on risk is potentially enormously beneficial to companies and to management. Ultimately what matters are not the end numbers, but the benefits of the processes which will be undertaken to arrive at them.

TABLE - Comparisons of the main Environmental Management Systems

BS 7750	EMAS	ISO 14001
IMPROVEMENTS Requires organisations to commit to continual improvement, which is a year-on-year enhancement of overall environmental performance, to be achieved by:- 1. Development of product quality and operational efficiency. 2. Enhanced resource utilisation. 3. The application of measures with a view to reducing adverse environmental effects to levels not exceeding those corresponding to economically viable application of best available technology (EVABAT).	IMPROVEMENTS Voluntary scheme, requiring organisations to commit to reasonable continuous improvement of environmental impacts to levels not exceeding economically viable applications of best available technology (EVABAT).	IMPROVEMENTS Continual improvement does not refer to the specific test of EVABAT. Instead organisations are to commit to the process of enhancing the environmental management system by implementing the specified core requirements of this international standard.
ORGANISATIONS Applies to any organised body or establishment, which may be multi-site.	ORGANISATIONS Defines organisations as being single site. Site is defined as all land on which industrial activity under the control of a company is carried out.	ORGANISATIONS Defines an organisation as any organised body or establishment. A single operating unit may be defined as an organisation.

BS 7750	EMAS	ISO 14001
EFFECTS CONSIDERED Provides for the establishment of a procedure for examination and evaluation of all effects both direct and indirect, on the environment.	EFFECTS CONSIDERED Provides for the establishment of a procedure for examination and evaluation of all effects both direct and indirect, on the environment. Provides for the identification, examination and assessment of environmental effects. No mention of indirect effects is made although Annex I, Part D provides for the assessment of significant impacts on the environment in general.	EFFECTS CONSIDERED Provides for the establishment of a procedure for identifying activities of the organisation that have a significant impact on the environment. This seems less strict as the organisation can ignore environmental aspects of its activities which it cannot control.
RANGE OF ENVIRONMENTAL EFFECTS The organisation is to consider the effect of its past, present and future activities and those of its contractors.	RANGE OF ENVIRONMENTAL EFFECTS As BS 7750.	RANGE OF ENVIRONMENTAL EFFECTS There is no specific reference to past, present and future activities or an organisation's contractors, though this may be included in the definition of environmental impact as "any change to the environment, whether adverse or beneficial, wholly or partially resulting from activities, products and services of the organisation".
REGISTERS A register is to be compiled of environmental effects considered significant.	REGISTERS As BS 7750.	REGISTERS There is no specific provision for a register of environmental effects. However, records are to be used when drawing up objectives, and the information is to be kept up to date. In addition, results of audits and reviews are to be recorded.
INITIAL REVIEW An initial preparatory environmental review of environmental issues should be made.	INITIAL REVIEW As BS 7750.	INITIAL REVIEW No specific requirement for an initial review of environmental issues, although this is implicit in the implementation of an effective environmental system under this standard.
LEGAL REQUIREMENTS Requires the organisation to keep a record of all applicable environmental legislation and regulations.	LEGAL REQUIREMENTS As BS 7750.	LEGAL REQUIREMENTS Organisations to have a procedure for identifying, gaining access to and complying with applicable environmental legislation and regulations.
OBJECTIVES Objectives are required to be publicly available, and policy statements should tell the reader from where details of these objectives can be obtained.	OBJECTIVES Objectives to be consistent with the environmental policy of the company. The environmental policy is to be publicly available.	OBJECTIVES As EMAS.
ENVIRONMENTAL STATEMENT An environmental management manual is to be prepared to include: a manual covering the whole organisation; divisional manuals; and, specialised manuals covering individual functions and activities. It must be detailed enough to be used by the system auditor for verification purposes. In addition, a public statement of the organisation's intentions and principles of action is to be made.	ENVIRONMENTAL STATEMENT An environmental statement is to be prepared after the environmental review and audit (i.e. audit to be carried out at a minimum of every three years). It is to be written for the public, and is a description of all environmental issues of relevance, the environmental policy, and the environmental management system. Simplified statements are to be prepared in intervening years.	ENVIRONMENTAL STATEMENT No equivalent of an environmental statement, though an organisation is required to consider the means for external communication of significant environmental aspects of its activities. Its environmental policy must be sufficiently clear to be understood by interested members of the public.
VALIDATION Validation required by personnel <i>independent</i> of the part of the organisation being audited. Therefore auditors may be either internal or external, but they must have appropriate expertise.	VALIDATION The environmental policy, management system, audit and statement are to be examined by an independent environmental verifier, to check that they meet the requirements of the Regulations. The validated environmental statement is to be forwarded to the competent body of the Member State in which the site is located, and it is to be disseminated to the public. Member States are to establish a system for the accreditation of independent environmental verifiers.	VALIDATION No external validation, but instead reliance on self determination.

Current Developments in Environmental Telematics

© Jason Perks, Urban Pollution Research Centre, Middlesex University

This article will be presented in two parts and is based on research conducted during the first half of 1996. The first part looks at environmental telematics projects which are currently being developed and has a European focus. The aims and objectives of the projects are discussed and each project briefly summarised.

The second part, which will be published in the next issue of Clean Air, will look at air quality data provision on the World Wide Web, and is intended to provide a summary of the availability of real time monitoring data.

Although the coverage is international there tends to be more information from the US due to their greater exploitation of the Internet.

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TELEMATICS

Telematics is derived from the word *telematique*, referring to the combination of telecommunications and computers or informatics². Thus a literal interpretation could mean almost any computer network or any kind of telecommunications network utilising computer technology.

As the power of computers and sophistication of telecommunications technology has increased, the possibilities for advanced telematics applications has expanded. There are now a large number of areas using telematics, some of the more common fields being:

- Health/Medicine
- Transport
- Education
- Environment

Health and medical telematics applications are probably the most widespread and established. Transport and education have also utilised telematics for some time, both are currently experiencing the rapid development of new applications. Environmental telematics as a recognised field is relatively new and references are therefore rather scarce.

Telecommunications

Communications technologies that include the terrestrial telephone, cable and cellular networks, satellite communications systems and the information superhighway.

Informatics

Computer-based systems for processing information. Increasingly this is being intertwined with telematics as networked systems are built and expanded. In the context of environmental telematics this includes topics such as database systems geographic information systems (GIS), modelling and simulation, computer graphics, user interface design, knowledge processing, neural networks, expert systems and multimedia¹.

ENVIRONMENTAL TELEMATICS

Telematics systems have been used for some time in environmental applications, particularly as a way of automating the monitoring of, for example, air and water quality. Typically these systems are automated sensors in the field, connected via telephone line to a central point where the raw data are collected, validated and processed by a computer. Another area which has historically utilised telematics is remote sensing, where data collected by satellites are transmitted to ground stations and often undergo intensive computerised data processing to produce useful environmental information.

A survey of current environmental telematics projects has identified applications broadly fitting into the following categories:

1. Environmental Information Systems (EIS) - National and regional scale integrated GIS and database systems covering a number of environmental media and pollutants.

2. Specific Pollutant or Medium Management Systems - Regional, sub-regional and urban systems covering one or more of:

- monitoring
- modelling/simulation
- forecasting
- controlling

of particular environmental aspects such as: groundwater quality, water quality and supply, air pollution, radioactive pollution, estuarine and coastal/marine pollution. Some of these are designed to act as emergency and disaster warning and management tools.

3. Satellite Remote Sensing - Use of earth observation data for environmental monitoring.

4. Integration with other Telematics Applications - Environmental monitoring is being combined with other telematics applications to enable enhanced forecasting and pollution control. For example:

- Air Quality Data + Meteorological Data and Forecasts
→ Air Quality Forecasts

- Air Quality Forecasts + Traffic Monitoring and Control
→ Avoidance of poor air quality 'hotspots'
5. Public Environmental Information Services - Projects aimed specifically at providing environmental information to all likely users.

This report concentrates on applications in 1. and 2. above.

ENVIRONMENTAL INFORMATION SYSTEMS

As we understand more about the interconnections between environmental pollutants, and the media into which they are released and pass through, we increasingly realise that environmental problems cannot be analysed on their own. They must be viewed in the context of all the other environmental pressures that may also have an effect. This has led to the formation of integrated environmental agencies responsible for overseeing a more holistic approach to environmental protection. Just as each pollutant or medium cannot be considered in isolation, neither can a single region or country when considering many forms of pollution, e.g. air pollution, radioactive releases and marine pollution. Because of this, many environmental telematics projects are aimed at integrating environmental information and monitoring systems to provide a comprehensive view of the environmental situation in a particular region, country or group of countries. Not only will environmental agencies make use of the information, but so will other policy makers and managers in local, regional and national government. The aim of this approach is to make this information available to as many relevant users as possible in the hope of achieving a coherent policy and management strategy that will include environmental considerations in all areas and levels of administration.

Nearly all EIS projects are designed to integrate existing information systems. Access is improved through the use of networks and the Internet; GIS, relational databases, multimedia and, in some cases, other types of visualisation, enhance the utility of the information. Many of the planned or implemented systems include tools for analysis, modelling, forecasting and presentation of integrated information. These features make for a powerful management tool which is intended to improve the ability of decision makers to include the consideration of environmental aspects into a wider range of topics. It should also enable such considerations to be more detailed and thorough.

Environmental Information System Projects

1. Environmental Management Architecture for Information Delivery (E-MAIL)³. Arno Basin, Italy; Tuscany, Italy; Fife, UK; Lyons, France; Corfu, Greece. This project intends to provide a multimedia interface between users and heterogeneous systems. This will support environmental decision makers, on a regional level, with environmental monitoring and planning activities.

Standard communication protocols will be used to combine information from distributed sources. The multimedia platform will then provide a standard set of tools for modelling, mapping, analysis and reporting.

2. Ecological and environmental monitoring and information system for management decision support in urban areas (ECOSIM)³. Berlin, Germany; Athens, Greece; Gdansk, Poland. ECOSIM is specifically intended to help public authorities in urban areas to achieve more accurate environmental impact assessments and to assist in pollution control planning. It will utilise existing monitoring networks and information systems as inputs to a powerful modelling and simulation package. Short-term pollution levels (approx. 24 hours) can also be predicted. Multimedia and GIS will optimise the usefulness of the information.

3. Public environmental information services for European cities (ENVIROCITY)³. Munich, Germany; Lamia, Greece; Vitoria, Spain; Antwerp, Belgium, Piraeus, Greece. Environmental information from existing sources is made accessible to the public via large city displays, public information terminals and the WWW. Initially this will be mainly air pollution information but inclusion of all relevant urban environmental data is envisaged. The software will be designed to provide a 'user-specified synthetic picture'³ of the information to aid comprehension.

4. Integrated Telematics System for Administrations Environmental Management (ITSAEM)³. Madrid, Spain; Groningen, Utrecht, Netherlands. Aimed specifically at public administrations this system is intended to provide information in a suitable form for each level of government (local regional and central). It 'will help administrations to acquire, store, analyse, interpret, interchange, and present ... environmental data, mainly produced from environmental audits'³. GIS, multimedia and knowledge-based systems will be utilised. One expected benefit is access by any citizen to environmental data - how this will be achieved is not stated.

5. Regional Environmental Management Support System Based on Telematics (REMSSBOT)³. Piedmont, Italy; Attica, Greece; Zeeland, Netherlands. Project integrating environmental information at a regional level. Uses a catalogue that describes what information is available from heterogeneous distributed sources and provides a procedure for accessing them. The advantage of this system is that existing technology and resources can be utilised making it relatively inexpensive.

6. Integrated and global support system for environmental management and monitoring (SIGMA)³. Madrid, Galicia, Spain; Noord-Brabant, Netherlands; Sollentuna, Sweden. SIGMA intends to design a system which will act as a 'management layer' on top of existing environmental information systems. It is seen as a step towards creating a global integrated environmental management system.

7. Sustainable Telematics for Environmental Management (STEM)³⁴. Assynt, UK; Valencia, Spain. A feasibility study into developing a telematics system providing information and resources for environmental management. Specifically intended for remote and ecologically sensitive regions. By using such tools as the WWW and multimedia interfaces it is hoped that the system will improve the ability of decision makers in remote areas to sustainably manage and develop them.

8. Transnational Environmental Management Support and Information System (TEMSIS)³. Saarbrücken, Germany; Sarreguemines, France. A project for combining local, regional and national environmental information so that trans-boundary environmental impacts can be assessed and incorporated into decision making at an early stage. Also intended to provide easier access to the most current information and to make the information accessible to the public via *Info.Kiosks* and the WWW. Use will be made of GIS, database and visualisation software.

9. Environmental Information System for Serbia⁵. This information system aims to cover all aspects relevant to environmental protection and is being implemented to assist new environmental protection legislation. It differs from most other projects in that much of the system will be starting from scratch rather than integrating existing networks. Designed mainly as a management tool.

10. National Environmental Network System (NENS)⁶. A monitoring, modelling and forecasting network for Greece, mainly for air and water quality, which is intended to be used as an integral part of government strategy, planning and pollution prevention. Information gathered is planned to be distributed to the public.

11. EIS for the Piemonte region of Italy⁷. This region already has separate monitoring networks for meteorology, water quality, air quality and hydrology. It is planned to integrate these by creating a standardised communications infrastructure and information content with controlled access.

AIR QUALITY TELEMATICS

As discussed earlier, telematics have been applied to air quality monitoring for many years. As automated sensors, telecommunication technology and computers have advanced, so has the ability to develop extensive on-line monitoring networks for a number of pollutants (most often NO, CO, O₃, SO₂, and PM₁₀). Most countries in 'the west' with air pollution problems now have coverage of the areas of most interest/concern at the very least.

Naturally those countries or regions which have or are implementing an environmental information system include their air quality networks, and so could be included in this section. However, unless the references to these projects include specific information relating to the air quality component they will not be covered.

Until recently air quality telematics systems were usually limited to monitoring, validation, quality assurance/control, and analysis tasks. Development of these systems includes the addition of modelling, simulation and forecasting techniques. Such developments make the information more useful to decision makers by enabling the investigation of the impacts of various strategies.

Forecasts allow the introduction of short term initiatives to reduce pollution problems as and when they occur, and to act as a warning system to alert the public. Whilst warnings increase public awareness, access to information in a readily comprehensible form is still relatively limited. Information is, or is planned to be, disseminated through:

- Public information kiosks or terminals
- Internet/WWW
- Public display boards
- Television
- Radio
- Teletext
- Videotel
- Telephone messages.

Further developments of air quality telematics are their integration with other networks to form EISs (see previous section) and their combination with other telematics applications to produce enhanced environmental applications, particularly in the area of traffic management.

Transport related air pollution has increased significantly over the past 10-15 years^{8,9} and is now probably the source of most concern, particularly in urban areas. It is not surprising then that transport telematics are being presented as a way of reducing air pollution in the worst affected areas. By linking air quality forecasting systems with traffic management systems it is hoped that likely hotspots can be targeted for remedial action. Transport telematics also offer the potential opportunity for increasing air quality information dissemination through the use of variable message signs, RDS-TMC and in-car displays^{10,11}. It seems likely that this area of integration will become increasingly prominent as a way of controlling (to a certain extent) urban air quality.

Air Quality Telematics Projects

1. Environmental Forecasting for the Effective Control of Traffic (EFFECTS)³. Gothenburg, Sweden; Leicester, Maidstone, UK; Volos, Greece. By integrating air quality models with real-time information on traffic flows, air quality and meteorology this project will predict air pollution 'hotspots'. Traffic management strategies, which include Variable Message Signs and radio traffic broadcasts (RDS-TMC), will then be used to reduce the pollution levels in predicted hotspots. The system will include roadside air quality sensor networks.

2. Integrated Environmental Monitoring, Forecasting and Warning Systems in Metropolitan Areas (EMMA)³. Genova, Italy; Leicester, UK; Madrid, Spain; Stockholm, Sweden. EMMA will develop an integrated modular telematics system for air quality monitoring and forecasting which can be applied to any European urban area. The main objectives are: the development of a simple European Air Quality Indicator (index) which is coherent with World Health Organisation and European Commission Directives; control and assurance of air quality data; accurate 24h and 48h forecasts; easy access to air quality information; dissemination to the public via Electronic Displays, Public Information Terminals, World Wide Web and RDS/TMC.

3. Public environmental information services for European cities (ENVIROCITY)³. Munich, Germany; Lamia, Greece; Vitoria, Spain; Antwerp, Belgium; Piraeus, Greece. Environmental information from existing sources is made accessible to the public via large city displays, public information terminals and the WWW. Initially this will be mainly air pollution information but inclusion of all relevant urban environmental data is envisaged. The software will be designed to provide a 'user-specified synthetic picture'³ of the information to aid comprehension.

4. AIRVIRO¹². This is a commercially available Computer Aided Air Management (CAAM) system which has been installed in over 20 sites in Europe, South America and South East Asia. Through detailed emission inventories for point sources and a traffic emissions database, temporally and spatially dependant emissions can be calculated. These are combined with meteorological data and dispersion modelling to produce a powerful air quality simulation package. Greater accuracy is obtained by comparison with, and incorporation of, air quality data. The system can be used to investigate the effects of various scenarios which would help planning and management strategy and policy making.

5. Turin 5T Project¹³. Turin, Italy. The main aim of this project is to integrate environmental considerations into traffic and transportation management. Forecasts are obtained by incorporating information from air quality and meteorological sensors, traffic measurement and emissions estimates into an emissions model of air quality. These are used to issue air pollution forecasts (8-10 hours) and warnings, implement traffic control strategies (including preventing access to hotspots), and provide air quality information to the public using videotel and public information terminals.

6. Transport-Related Air-Management System (TRAMS)¹⁴. Illinois, US. A hypertext, hypermedia system enabling planners and decision makers to access legislation and other information related to air quality and transport. Through a graphical interface users are able to investigate the connections between transport policies and air pollution impacts. The system is PC based with the possibility of access through a network and the Internet.

List of Abbreviations

WWW	The World Wide Web
RDS-TMC	Radio Data System - Traffic Message Channel
GIS	Geographical Information System
EIS	Environmental Information System
CAAM	Computer Aided Air Management
PC	Personal Computer
NO	Nitric Oxide
CO	Carbon Monoxide
O ₃	Ozone
SO ₂	Sulphur Dioxide
PM ₁₀	Particulates

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UPDATE

IPPC DIRECTIVE ADOPTED

The EC's Council of Ministers finally adopted the Directive on Integrated Pollution Prevention Control on 24 September. Member States must implement the Directive within three years of its formal adoption.

The main aim of the Directive (96/61/EC) is to prevent, where practicable, or minimise the pollution of air, land and water by potentially polluting industrial installations "so as to achieve a high level of protection for the environment as a whole". While IPPC and IPC are similar in a number of ways, a far greater number of installations are likely to fall within the scope of IPPC - about a further 4,000, on top of the estimated 3,000 IPC processes; 1,600 of the extra processes to be covered by IPPC are currently Part B processes regulated for air pollution control only under the *Environmental Protection Act 1990*.

Annex I to the Directive lists industrial activities to which the Directive would apply (see box). Some of these are already covered by IPC or air pollution control but the Directive will also apply to some activities which currently fall outside the scope of the *Environmental Protection Act 1990*.

IPPC Activities

energy industry; production and processing of metals; mineral industry; chemical industry; waste management; Other activities (which include: intensive livestock units - poultry rearing and piggeries, exceeding certain thresholds; food and drink industry - raw meat, vegetables and milk processes, exceeding certain thresholds)

Operators of installations covered by the Directive would need to apply for a permit from the competent authority (i.e. enforcing authority); permits will include conditions relating to the operation of the plant, including emission limit values for certain substances and preparations listed in Annex III to the Directive which would be based on best available techniques (BAT) although local environmental conditions, geographical location and other technical characteristics may be taken into account; consumption of raw materials, energy efficiency, heat, noise, light and vibration and site clean-up will also need to be taken into account.

Permit conditions will need to ensure no breach of EC environmental quality standards or other EC legislation and ensure they achieve "a high level of protection for the environment taken as a whole". Monitoring, with the results certified by an independent test laboratory conforming to CEN standard 45001, will also be required.

Applications for a permit would have to be decided within six months of receipt and permits reviewed every ten years. Public consultation requirements and access to permits and other data are similar to those under Part I of the *Environmental Protection Act 1990*.

New installations and those undergoing a substantial change will be required to apply for a permit as soon as the Directive comes into effect in 1999, with an eight year transitional period for existing plant. Where an existing installation is breaching an EC EQS (or WHO guideline if there is no EC one) for a specific substance, it should be brought within the system as soon as possible. Where an installation is already authorised under national legislation, it is likely that new conditions could be attached to the authorisation to ensure compliance with the Directive.

AIR QUALITY DIRECTIVE ADOPTED

The EC's Council of Ministers also adopted a Framework Directive on the Assessment and Management of Ambient Air Quality on 27 September. A main aim of the Directive is to protect human health and the environment; this will be achieved through

- fixing objectives for air quality limit values and alert thresholds;
- assessing air quality in a uniform manner;
- making information available to the public;
- maintaining or improving ambient air quality.

Continuous improvement of air quality will be required to reach specified long term limit values (LTLV) by a date to be specified; the Directive also raises the possibility of setting interim current permitted values (CPV) which incorporate a margin of exceedance and which decrease with time. The public would have to be informed when alert thresholds were breached.

Member states would be required to classify areas according to three criteria:

- **area of poor air quality:** where AQ exceeds CPV, measures and programmes must aim to achieve CPV as soon as possible and to achieve LTLV in a specified time limit;
- **area of improving air quality:** where AQ is between CPV and LTLV, no increase allowed and LTLV to be achieved within a specified time limit;
- **area of good air quality:** no action required where AQ is under LTLV.

In areas of good air quality any increase in pollutant levels, e.g. because of a new industrial or other development, would need to be justified on the basis that the principles of sustainable development were still being met.

Criteria for monitoring, modelling and estimation techniques will be fixed for individual pollutants. Monitoring will be mandatory in population centres of more than 250,000, in those areas where the level of the pollutant is above a certain proportion of its limit value, and in other areas where limit values are exceeded. Member States must designate the national, regional or local authorities to be responsible for implementation of the Directive and also accredit laboratories for quality assurance and assessment.

“Daughter” Directives will set air quality objectives, limit values, alert thresholds, guidance on monitoring, siting and measurement methods. Air quality standards will usually be set in accordance with WHO air quality guidelines. The Commission is to issue proposals for sulphur dioxide, particulates, nitrogen dioxide and lead by 31 December 1996; for benzene and carbon monoxide by 31 December 1997; for ozone by 1 March 1998; proposals for PAHs, cadmium, arsenic, nickel and mercury will be prepared as soon as possible but no later than 31 December 1999. Proposals for other substances to be covered by daughter Directives will be considered on the basis of new scientific evidence on environmental or health effects.

AIR QUALITY INFORMATION ONLINE

The National Air Quality Archive is now available on the World Wide Web. Developed by the National Environmental Technology Centre on behalf of the Department of the Environment, the first phase of the archive allows users access to all automatic data on air quality collected since 1972. This data is presented in simple tabular format, so it loads quickly and can be readily downloaded and stored. The provision of the archive is in accordance with the DoE's policy of providing the public with timely, relevant information on air quality. By the end of the year data from non automatic networks, site information, information from the 'A-Z of Air Quality' and air quality statistics will also be available. For those who are not connected to the internet, the archive will be available on CD-ROM.

The National Air Quality Archive is at
<http://www.open.gov.uk.doe/doehome.htm>

DOE are also seeking to build an electronic 'one stop shop' for environmental information, modelled on the annual *Digest of Environmental Statistics* and the recent report *Indicators of Sustainable Development in the United Kingdom*. This will form a part of the The European Information and Observation Network (EIONET) which is being developed by the European Environment Agency.

More information is available from Jock Martin at the Environment Protection Statistics and Information Management Division in DOE. Tel: 0171 276 8748, Email: jmartin.epsim@gt.net.gov.uk

STRATEGY FOR THE ENVIRONMENT

The Environment Agency has asked for comments on its draft *Strategy for the Environment*; this sets out initial thinking for a long-term strategy to fulfil the Agency's vision of a better environment in England and Wales for present and future generations.

The strategy describes how the Agency will implement long-term aims and objectives to protect and enhance the environment, maintain and improve present levels of service and implement new duties introduced by the *Environment Act 1995*. The Agency is particularly interested in views on

- its overall policies and priorities for the environment;
- establishing partnerships with its key stakeholders;
- its long term aim of educating and informing to influence behaviour in order to protect and enhance the environment;
- integration of its activities and functions so that the Agency is greater than the sum of its parts;
- the use of alternatives to regulation such as voluntary environmental management schemes and economic instruments.

URBAN AIR QUALITY CONFERENCE

This was the first international conference on *Urban Air Quality - Monitoring and Modelling* to be organised by the Environmental Physics Group of the Institute of Physics. The meeting, held in July 1996, was supported by the Royal Society of Chemistry, The Royal Meteorological Society and NSCA. Over 100 scientists attended from various countries with 40 oral and poster presentations including invited talks by Professor Roy Harrison (University of Birmingham) and Dr. Andreas Skouloudis (ISPRA, Italy). The papers presented at the conference will be peer reviewed and published as a special issue of the *International Journal of Environmental Monitoring and Assessment*.

Although air quality has gained importance throughout the world, it is especially in areas of high urban development that the problems are particularly acute. It is thus essential that forums exist where scientific ideas can be discussed and exchanged for the benefit of all.

Many participants expressed the need for a second international conference and plans are therefore proceeding to hold the next meeting in 1998. If you are interested in this meeting please contact Dr. Ranjeet S. Sokhi, Head of

the Atmospheric Science Research Group, Department of Environmental Sciences, University of Hertfordshire, College Lane, Hatfield, Hertfordshire AL10 9AB. Tel: 01707 284520. Fax: 01707 285258 or 284514. Email: r.s.sokhi@herts.ac.uk.

PETROL STORAGE REGULATIONS

Regulations implementing the 1994 EC Directive on controlling VOC emissions from the storage and distribution of petrol were laid before Parliament on 24 October.

The Regulations, which are made under the *Environmental Protection Act 1990*, will require the fitting and use of equipment in the distribution and storage of petrol to capture and recover petrol vapours instead of venting them to the atmosphere; this will help to reduce emissions of VOCs which contribute to the formation of ground-level ozone.

The Directive allows a derogation for small service stations with an annual throughput of 100-500 m³ in areas where emissions are unlikely to contribute significantly to environmental or health problems. The Regulations apply this derogation to new small service stations in rural areas in the northern half of Scotland - the derogated areas are defined in the volume of maps attached to the Regulations.

The Regulations will apply immediately to any proposals for new service stations outside the areas of derogation, with a phased implementation for existing service stations running to 2004. Existing small service stations will not be required to comply with the regulations until 2004 and those with an annual throughput of less than 100 m³ are exempt from the requirements.

TRANSPORT AND THE ENVIRONMENT

The Royal Commission on Environmental Pollution is reviewing the issues raised by its report *Transport and the Environment* (report no. 18, 1994), in the light of subsequent progress. It has asked organisations and individuals to draw its attention to any material (factual or analytical) published since 1994 with particular attention to land transport and

- the environmental impacts of different modes of transport per tonne-km;
- the costs imposed by pollution from vehicle emissions or by traffic congestion, or by measures to reduce such pollution or restrain traffic;
- the aggregate demands for transport created by different patterns of development;
- the impact on travel of the present rules for company cars;
- the success of measures to reduce car dependence;
- the effectiveness of measures to increase use of public transport, cycling or walking;

- the effectiveness of present regulatory or administrative structures.

CAR FREE DAY

Pedestrians and cyclists should not have to endure quite such fume-laden journeys on 17 June 1997 - the date chosen for Britain's first car-free day. Motorists will be asked to leave their cars at home and either use public transport, bicycles or their feet to get to work.

LET'S GET WALKING

The Pedestrian Association's new environmental campaign launched during the Summer of 1996 aims to put walking at the heart of urban transport policy and to encourage people to make more journeys on foot.

The campaign, which has been endorsed by NSCA, has three priority projects: *Protect our Pavements* is aimed at improving the quality of the basic pedestrian environment, which is currently subject to many forms of damage and disruption. *Pedestrians on the Road* will aim to improve conditions for pedestrians in relation to other road-users, such as more pedestrian crossings. *A Voice for Pedestrians* will aim to increase representation of pedestrian interests in decision making, particularly at local level.

For more details contact the Pedestrian Association on 0171-490 0750.

NOISE NETWORK

Launched in September 1996 by Val Gibson, founder of the Right to Peace and Quiet Campaign which was disbanded in April 1996, the Noise Network's main objective is to raise the profile of noise as an environmental and social issue. The Network is a voluntary non-profit making organisation and it intends to act as a watchdog by monitoring the service that local authorities provide for noise complainants, as well as checking their take-up of the new *Noise Act* (see Autumn/Winter 1996 issue of *Clean Air*).

The Noise Network does not have a membership scheme and does not handle individual complaints. Instead it will encourage individuals to set up, or join, local "Noise Action Groups" - voluntary self-help groups that will enable people with noise problems to meet others that have been through the same experience. A general information pack (£5) will include details on how to set up a Noise Action Group and a questionnaire to enable the Noise Network to monitor the progress of complaints.

The Noise Network can be contacted at PO Box 968, London SE2 9RL; Tel & Fax: 0181 312 9997.

QUIETER VEHICLES

All new vehicle registrations had to meet stricter noise limits from 1 October 1996 (new model types were

required to meet the limits from 1 October 1995). The reductions in permitted noise limits range from 3 d(B)A for new passenger cars and the largest coaches, to 4 d(B)A for the heaviest goods vehicles and 5 d(B)A for intermediate trucks. (A reduction of 10 d(B)A is equivalent to a halving of perceived noise levels.)

Other areas currently being considered at EC or national level with a view to their potential for noise reduction, include "body rattle" from heavy lorries, tyre noise and improved road surfaces.

RESEARCH INTO AIR POLLUTION AND RESPIRATORY DISEASE

Twenty-six new research projects are to receive a total of £3.5 million public funding - 13 from the Department of Health, 4 from the Department of Environment and 4 from the Medical Research Council, and 5 from the DH/DOE jointly. The projects fall into five main categories:

- studies to look at how air pollutants cause health problems;
- exposure measurement and monitoring;
- understanding the relationship between exposure and health effects, especially in children;
- epidemiology;
- management of respiratory disease.

The projects have been chosen from over 170 applications for funding resulting from a call to the scientific community for proposals particularly relating to air pollution and respiratory disease. This follows a workshop held by the Medical Research Council's Institute for Environment and Health with the Departments of Health and Environment to discuss research priorities. The recommendations of the workshop are available in an IEH report *Air Pollution and Respiratory Disease: UK Research Priorities*, copies of which are available from the IEH, Tel: 0116 233 1600. A list of the projects which have received funding is available from the MRC Press Office, Tel: 0171 636 5422.

CHILDREN AND SMOKING

In an average week around 250,000 children buy cigarettes illegally. These illegal sales generate £108 million in tobacco taxation. NSCA has joined 60 other organisations (under the auspices of the Tobacco Control Alliance) to call on the Government to invest an equivalent amount on children's health.

In *Stop Cashing in on Children Smoking*, the Tobacco Control Alliance suggests that £108 million could fund a national programme which would:

- Eradicate all forms of tobacco advertising, including sponsorship;
- Prevent illegal sales to children, through a strengthened inspection scheme;
- Support smokers who want to quit: two-thirds of teenagers and 50% of adults who smoke say they want to give up. A Family Health Foundation should be set up to provide community based help for people who want to stop smoking;
- Increase health education to children on the dangers of smoking.

NSCA also supported the Tobacco Control Alliance in asking the Chancellor to increase the price of a packet of cigarettes by 14p in his budget, as well as increasing the price of other tobacco products (see NSCA News & Views section).

MEMBERS' NEWS

Over 300 delegates enjoyed the autumn sunshine in Brighton at this year's **NSCA Conference**. The keynote address by Professor **Gordon Conway** set the theme for much of the week; involvement of local communities in environmental management. Other highlights included a speech on UK noise policy from Environment Minister **James Clappison** and a debate on the future of road transport featuring speakers from the AA, motor manufacturers, oil industry and public transport sectors. Downstairs in the exhibition hall, many of the parallel technical sessions were full to capacity. The final morning saw a roundup of new information on health and air quality management, including a presentation on indoor air quality. An excellent conference dinner topped the social programme. Plans are already being laid for Glasgow next year involving a ceilidh with optional kilt hire! 20-23 October are the dates for your 1997 diary.

The Conference provided an opportunity for many members to bid farewell to Secretary General **Tom Crossett**, who leaves the Society at the end of the year. Thanks to donations from members, Tom was presented with a huge urn during the opening ceremony (see photo report).

Every picture tells a story, but you'd be hard put to guess that the photo below was issued to illustrate the success of **Croydon Council's Don't Choke Croydon Campaign**. Nearly 1,000 people sent in pledges not to use their cars for two days a week in June, resulting in an estimated saving of 8,250kg of CO₂. The pledges were entered in a draw and the winners are shown here with Cllr Helen Salmon, including firefighter Paul Pinder (in the helmet) who cycled to his firestation (and not, we hope, to actual fires).

Croydon is also one of four London local authorities (alongside **Merton, Haringey** and **Westminster**) which have now signed up to the **London First Clean Air Charter for Best Fleet Practice**. Signatories to the charter have to develop an action programme to make their vehicle fleet more environmentally friendly and aim to increase fuel efficiency by 10%.

Sainsbury's have produced their first major environmental audit of products and trading activities. The report gives detailed assessment of monitoring a range of environmental impacts and sets targets for future improvement. Jonathan Porritt's foreword describes progress as "reasonable but not exactly breathtaking". However it could prove influential in setting a benchmark which other retailers will want to match.



Nottingham City Council Environmental Services has become the first local authority department to be awarded the International Standards Organisation ISO14001 environmental management standard. Over the next few months the department plans to offer local businesses a consultancy service to help them improve environmental performance and achieve the new standard.

We promise this is positively the last in our series of politicians in photo-opportunities with CNG vehicles (see page 30). This time it's Neil Kinnock handing over the keys to one of eleven gas vehicles to be used in a joint venture between NSCA members **Ford, British Gas** and **Bristol City Council**. In the background, incidentally, is the Bristol CREATE environment centre, which recently hosted a meeting of NSCA's Local Air Quality Information Exchange Network. The press release doesn't explain why there is someone in a tiger costume lurking behind the van.

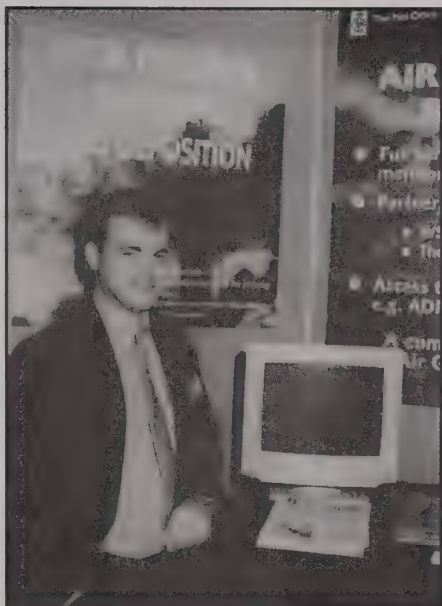
CONFERENCE PHOTO REPORT



*Secretary Generals past, present and future:
John Langston, Tom Crossett and Richard Mills.*



*NSCA staff Malcolm Eames, Clare Carruthers and Sally May
prepare to greet delegates.*



*Keith Simms of W S Atkins displays some
modelling software.*



*Tom Crossett receives his presentaion from
NSCA President Dame Barbara Clayton.*



*The Environment Agency's Ed Gallagher
addresses the Conference.*



Coffee break in the Exhibition Hall.



*Environment Minister James Clappison prepares to speak on
noise policy.*



Elsewhere...

The latest edition of the journal *Atmospheric Environment* (Vol 31 No.2) carries a good example of a scientific paper proving something which everyone already knows. Research at **Nottingham University** using tracer gases in a windtunnel with scale model cars suggests that "...the level of pollution received by a commuter in slow-moving heavy traffic may be strongly influenced by the pollution produced from the car immediately in front".

Our summer edition brought you news of the awesome pollution potential of the petrol-driven American **lawnmower**. Help is at hand. Cordless electric lawn mowers have significantly better emission characteristics, even taking into account the associated power plant emissions. By comparison petrol mowers emit twice as much CO₂, eight times as much NO_x, 3,300 times more hydrocarbons and 5,000 times more CO. Naturally, this information comes to you courtesy of the US **Electric Power Research Institute**.

Going one better than cordless mowers, **Friends of the Earth** are promoting a **battery-free radio**, powered by an "easy to use winding handle", as a Christmas present. Developed for parts of the world where batteries are rare or expensive, it's less easy to see why anyone should want one in the UK. "It's a great alternative to the waste and cost of the battery-hungry portable" say FOE, but we reckon you could buy an ordinary model, plus rechargeable batteries, plus a charger for much less than the asking price of £60. Sounds like a wind-up.

On the cover of the **CIEH** annual report, the Institute's coat of arms "*Amicus Humani Generis*" is helpfully translated as "Friend of the Human Race". We thought most EHOs were actually members of it.

One of the most memorable moments of the NSCA Conference was provided by opening speaker **Gordon Conway** as he produced an overhead slide with the question: "How much LSD does it take to make an elephant happy?". If you are wondering what this has to do with his topic of sustainable agriculture, he was illustrating the difficulty of scaling up dose-response data. Extrapolating data on human drug response to elephants would produce differing answers depending upon the use of criteria such as body weight, brain size or metabolic rate. However, next time you visit a zoo, beware of anyone offering "elephant trips".

BOOKS & REPORTS

Should Britain Continue to Waste Municipal Waste - a Discussion Paper. Byrom Lees. Available from NSCA, £25.00.

In 1990 NSCA published a discussion paper - *Can We Afford to Waste Municipal Waste?* It emphasised the major contribution to pollution caused by methane and leachate when municipal waste was disposed of on landfill sites. Since 1990, there have been further meetings, conferences and papers dealing with the subject, notably the 17th report of the Royal Commission on Environmental Pollution - *Incineration of Waste* (1993). The RCEP recommended effective action, including the application of a landfill tax on the "polluter pays principle", emphasising the contribution of methane to global warming.

This paper emphasises that the UK is still far behind other developed countries in tackling this problem. At least 95% of non-recycled municipal waste still goes to landfill, despite modifications to incineration plant in various parts of the country to meet EC standards. The discussion paper again emphasises the pollution caused by the emission of methane and leachate; flaring or utilisation of methane from landfill is considered desirable but it is only a palliative - the nature of landfill is such that even on the best sites only a proportion of the methane can be collected; there is still emission of methane to the atmosphere with the resulting greenhouse effect and global warming. It is considered that progress has been unsatisfactory, and that excess municipal waste from the UK's towns and cities should be incinerated, preferably with combined heat and power.

Environmental Impact of Chemicals: Assessment and Control. Ed M. D. Quint, D. Taylor, R. Purchase, *The Royal Society of Chemistry*, 1996. £69.50. ISBN 0854047956.

A collection of views and theoretical discussions from industrialists, scientists and regulators, which outline current legislation and practice in risk assessment. Written from an applied perspective, it examines the tools of environmental impact assessment - toxicology, epidemiology, exposure modelling and analytical chemistry. It also covers the difficulties of communicating the results to the public. The book is based on symposia held in London in Autumn 1994.

Spilling The Genes: What We Should Know About Genetically Engineered Foods. *The Genetics Forum*, 1996. £6.95. ISBN 0952820110. (Available from *The Genetic Forum*, 3rd floor, 5-11 Worship Street, London, EC2A 2BH).

Produced by Britain's leading independent watchdog on genetic engineering, *Spilling the Genes* provides an up-to-date and accessible guide to the biotechnological revolution hitting our supermarket shelves: from fishy tomatoes and fruit which won't rot to giant salmon and herbicide resistant soya. The ability to alter the genetic structure of animals and plants used for food may bring new benefits but also poses new risks which we are only just beginning to recognise. Will these new techniques provide us with safer, healthier more affordable food, or are we all simply guinea-pigs in a massive experiment for foods whose benefits are not yet proven and whose long-term risks are uncertain?

Spilling the Genes challenges official assumptions about the need for genetically engineered foods and highlights the risks to human health, animal welfare and the environment from what it argues is a poorly understood and inadequately controlled technology. Essential reading for Environmental Health and Trading Standards Officers, and all those concerned with the safety and quality of their food.

Speed Control And Transport Policy. S. Plowden and M. Hillman, *Policy Studies Institute*, 1996. £14.95. ISBN 0 85374 692 3.

Although speed limits exist in all countries, the great potential of speed limits as an instrument of transport policy has never been properly explored. Plowden and Hillman set out to do just that and in so doing have produced both a thoughtful and thought provoking contribution to the 'great transport debate'.

The authors trace the connections between speed and the various harmful effects of road traffic and discuss the likely effects of lower speeds on journey times and travel patterns. They calculate that the standard urban speed limit should be reduced to 20 mph and that the national limit should be no more than 55 mph. Perhaps most controversial Plowden and Hillman argue that the most effective means of enforcing speed limits would be through retro-fitting variable speed limiters to existing vehicles. In addition, they suggest if top speed and acceleration were lowered, vehicles could be much more fuel-efficient and less polluting.

Air Pollution IV - Monitoring, Simulation and Control. *ed B. Caussade et al, 1996. £245. ISBN 1853124222.*

This volume constitutes part of the proceedings of the Fourth International Conference on Air Pollution held in Toulouse, France in August 1996. It presents and discusses advances in understanding, monitoring, simulation and management of air pollution problems. The book is divided into 13 sections covering modelling techniques, data analysis, emissions and management techniques.

The EU's Eco Audit Regulation: the Role and Accreditation of Environmental Verifiers in Six Member States. *H. Falk, D. Wilkinson, 1996. £15. ISBN 1873906080.*

This report provides an examination of how the EMAS Regulation, which came into effect in 1995, is being implemented in Austria, Denmark, France, Germany, The Netherlands and the UK. It examines the function and competence of environmental verifiers, the nature of accreditation systems and the significance of the statements produced under the Scheme. As well as examining EMAS in these EU states, the report explains the role of the accreditation system in EMAS. It is aimed at managers, auditors, verifiers and government officials operating the scheme.

Guide to European Union Funding for NGO. *ed Tony Venables, European Citizen Action Service, 1996. BEF1,300 NGOs, BEF 2,000 others. ISBN 2873920041.*

This guide aims to provide a practical summary of the EU funds available for NGO projects. It stresses that the purpose of the EU is to further European integration, so in lobbying for funding it is essential to present ideas rather than to ask directly for money. Potential pitfalls in the bureaucratic process are also outlined. A brief overview of the mysteries of the EU budget, Structural Funds and EU institutions help to put the grants available into context. A contacts list and sample application forms are also included.

Bills of Health. *R. Lawson, Radcliffe Medical Press, 1996. £17.50. ISBN 1857751019.*

This book provides a comprehensive overview of the issues that have repercussions for health and consequently cost implications for the NHS and for society as a whole. It analyses the costs of social and environmental deprivation in terms of costs to the NHS. Chapters on unemployment, poor housing, global environmental issues, pollution, food and drugs present the problems and offer possible solutions that should, in the long term, be cost saving. Its idiosyncratic style makes it a very accessible account of concerns about environmental and social degradation in terms of health effects. For example, on population "...the main cause for pregnancy among some single young women is not so much a great desire to jump the queue for housing as a common or garden loss of inhibitions as the result of getting drunk at a party". The author also puts forward a theory that the use of artificial perfumes may

explain the prevalence of allergic disease in the wealthy and firstborn children - "Aristocrats would have used more perfume, and the environment of eldest and only children is considerably more fragrant than a house full of children, where the mother tends to give up trying to keep the place in tip top cleanliness".

Overall, the author sets out a cogent argument for investment in employment, housing and environmental protection as the route to a healthy society and therefore a sound economy.

Waste Watchers. *Leeds Animation Workshop. 1996. 12 minutes, colour, 16mm film and video. £40.00, £10.00 hire.*

A short animated film designed to encourage energy conservation at home, school and work. Suitable for all ages, it charts the progress of a special agent sent to earth on a mission to prevent the inhabitants from destroying their atmosphere. The greenhouse effect, global warming and simple practical measures that can be taken to improve energy efficiency are presented as a humorous story. Employed as an energy agony aunt, the well intentioned alien provides simple, practical tips on energy conservation.

FORTHCOMING NSCA EVENTS

Tuesday 11 February 1997

Training Seminar: NEC, Birmingham

Indoor Air Quality

Tuesday 15 and Wednesday 16 April 1997

Spring Workshop: Abingdon, Oxfordshire

Local Air Quality Management

Tuesday 17 June 1997

Training Seminar

NEC Birmingham

Tuesday 16 September 1997

Training Seminar

NEC Birmingham

Monday 20 - Thursday 23 October 1997

Environmental Protection 1997

NSCA's 64th Annual Conference - Glasgow

Tuesday 18 November 1997

Training Seminar

NEC Birmingham

For further details please contact

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Available February 1997

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The 1997 edition has been substantially rewritten to include the draft National Air Quality Strategy, the Noise Act 1996, the Special Waste Regulations 1996, the Industrial Pollution Control (Northern Ireland) Order 1996 and the Waste and Contaminated Land (Northern Ireland) Order 1996, alongside the usual chapters covering integrated pollution control, air pollution, waste, noise and water.

Appendices list prescribed substances, Part A and B processes and process guidance notes, smoke control authorised fuels, EC Directives, and water quality regulations. The Handbook is a set reference book for many university environmental courses.

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"The UK's most important reference work on environmental legislation and related issues. I unhesitatingly recommend this publication . . . it is excellent value."

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"Bang up to date. Every lawyer should have one."

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The National Society for Clean Air and Environmental Protection produces information, organises conferences and training events, and campaigns on air pollution, noise and environmental protection issues. Founded in 1899, the Society's work on smoke control led to the Clean Air Acts. More recently NSCA has been influential in developing thinking on integrated pollution control, noise legislation, and air quality management.

NSCA's membership is largely made up of organisations with a direct involvement in environmental protection: industry, local authorities, universities and colleges, professional institutions, environmental consultancies and regulatory agencies. Individual membership is also available to environmental specialists within industry, local authorities, central government, technical, academic and institutional bodies.

Members benefit from joining a unique network of individuals who share an interest in a realistic approach to environmental protection policy; from access to up-to-date and relevant information; from reduced fees at NSCA conferences and training events. They contribute to NSCA's regional and national activities; to environmental policy development; to translating policy into practice; to the Society's wide-ranging educational programmes.

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EDITORIAL

The Developing Role of NSCA

Historians who venture into accounts of the last 100 years have already begun to label this the Century of Catastrophe. Laymen with any familiarity with the political events of the first half will recognise why. But with grisly exceptions something more approaching normality has prevailed in more recent decades, in international politics at least.

But what such a label reminds us is that, in its second half, a different sort of catastrophe still threatens. The destruction of species and habitats has reached a scale which reflects the contrast between the total wars of this century and the more limited and isolated conflicts of previous centuries. Further, that destruction has affected both other species and our own. The impact of contemporary western technology on other cultures is still all too often to undermine established patterns of life, without providing any alternative which is sustainable in the context within which they must operate. The fact that changes may bring material benefits, and that the people concerned are very often willing participants, cannot obscure the dilemmas.

The term "Sustainable Development" encapsulates these problems and is the overwhelming issue of our time. But in an era where the soundbite rules, those of us committed to it now face two risks. One is that for those already engaged in the debate a sort of boredom will take over, and attention shift elsewhere, driven by the constant competition for novelty and headlines. The other and greater risk is that the apparent distance between such a term and the everyday language and experience of many - perhaps even most - people will mean that its radical implications are missed.

For a relatively small national charity in a relatively small country - even one with wide ranging membership across local government, business and academia - the scale of the problems and the obvious limit on what any one body can contribute must seem daunting.

But as the NSCA approaches its second century there are grounds for encouragement and hope.

In our own country air quality continues to improve, not least through the efforts of the Society. Of course, there remains much to be done. Understanding is limited and new risks are regularly identified. The objectives of the National Air Quality Strategy - which would largely secure sustainability at least for that medium - will not be easy to achieve. The road is bound to be bumpy, demanding continued vigilance, effort and flexibility from public and voluntary bodies alike. But overall there is cause for encouragement.

In much of the rest of the world, by contrast, air pollution is either increasing or only slowly abating. So there is also the opportunity - indeed the obligation - on Societies such as our own to see that the lessons learnt in securing some improvement here over the last century are available to any elsewhere who may wish to take advantage of them.

Both domestically and internationally there therefore remains a big agenda on air. But the change of the Society's name some years ago to embrace environmental protection generally, and its recent work on noise, waste, energy and industrial policy, reminds us that this is only a start.

The improving trends achieved in air quality in the UK are not matched in some other environmental media and issues. But experience on air quality improvements means that the Society has a significant contribution to make across that much wider front. The concept of critical loads in air pollution anticipated the wider concept of environmental sustainability and is still in some ways its more sophisticated and successful application. Through integrated pollution control, in the UK and now in Europe, the basic concepts of air pollution control have been largely extended to other media. So there are great opportunities for those involved in air pollution to make a contribution across a wide spectrum. This is further reflected in the Society's recognition that its continuing work to develop local air quality management must be set within the wider concept of local environmental management, which it has been pioneering.

In taking on the privilege and challenge of the Society's Secretaryship-General, I have an absolute commitment to the role of voluntary bodies and a firm belief that they can make a contribution, and one which, as the NSCA's work of recent decades shows, can make a difference. I look forward to doing all I can to contribute to that process over the next few years.

Richard Mills

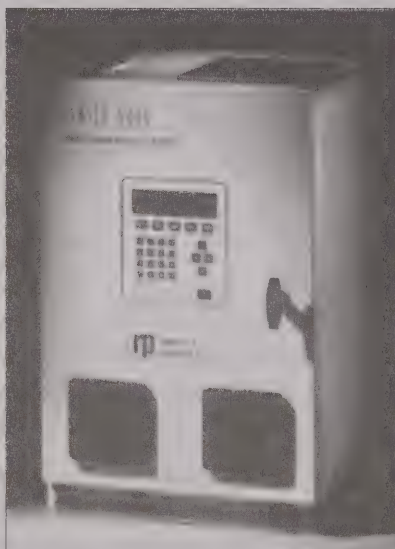
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NCSA NEWS & VIEWS

NSCA WELCOMES BUDGET

NSCA gave an enthusiastic welcome to the Chancellor's Budget announcement of a package of measures to tackle particulate pollution from road traffic (26 November 1996). The draft National Air Quality Strategy revealed the need for additional policy measures to tackle particulate pollution and protect public health. The measures announced by the Chancellor, said NSCA, were the most significant attempt to clean up road transport since the introduction of the tax differential on unleaded petrol and were just the sort of changes for which NSCA had been campaigning. The measures announced by the Chancellor were:

- **25% reduction on road fuel duties on gas fuels:** gas powered vehicles significantly reduce emissions of particulates. They also produce around one-third less carbon dioxide than petrol vehicles.
- **1p tax differential to encourage the use of ultra-low sulphur diesel:** cleaner grades of diesel, such as "City Diesel", have been shown to significantly reduce particulate emissions. Ultra-low sulphur diesel has the advantage that it can be used in existing vehicles with no conversion costs. However, these higher grade fuels have previously cost more than conventional diesel.
- **£500 reduction in vehicle excise duty for lorries meeting strict emission standards:** this will encourage operators to retro-fit particulate traps and invest in other cleaner vehicles and technologies.

NITROGEN DIOXIDE STANDARD

Following the Expert Panel on Air Quality Standards (EPAQS) recommendation of an air quality standard for nitrogen dioxide in the UK of 150 ppb, measured as an hourly average, the Government invited views on whether this should be incorporated in the National Air Quality Strategy. The current draft of the Strategy proposes an AQ objective of 104.6 ppb as an hourly average (the WHO recommendation).

In its response, NSCA reiterated its view that the protection of public health should remain paramount in the setting of AQ standards and that these should be based on the best scientific evidence and advice; while any proposal to weaken AQ standards obviously needed careful consideration, the EPAQS report had identified legitimate scientific concerns over the basis upon which the WHO standard had been set.

NSCA also made the following points:

- the likelihood of achieving the Strategy's target for ozone if a lower standard (i.e. 150 ppb) for nitrogen dioxide is adopted; this would also need to be considered in detail in the final draft of the Strategy;
- if the proposed hourly standard of 150 ppb for nitrogen dioxide is adopted, there would be a strong case for requiring full compliance by 2005;
- with respect to the proposal to retain the WHO annual standard for nitrogen dioxide of 20 ppb (measured as an annual average), the Strategy should properly reflect the EPAQS call for reductions in annual average nitrogen dioxide levels in our towns and cities.

CONTAMINATED LAND

Draft statutory guidance on contaminated land was published in September 1996, and a number of draft Regulations in November. These relate to the planned implementation of Part IIA of the *Environmental Protection Act 1990*. Local authorities will be responsible for enforcing most of the new legislation on contaminated land, with the Environment Agency/SEPA responsible for sites designated as "special" owing to the nature of contamination.

NSCA prefaced its comments on the draft guidance by expressing concern that sufficient training and resources needed to be made available to ensure that local authorities were capable of fulfilling their new responsibilities effectively. NSCA also expressed concern that the proposed new procedures for dealing with contaminated land may cause blight and result in considerable litigation, with all the costs which that will entail.

NSCA made a number of comments relating to both the introduction of the new legislation and to the draft statutory guidance, including:

1. Implementation

Given the complex nature of the guidance, NSCA suggests that

- a) Consideration should be given to piloting the legislation in a few areas;
- b) A central advisory unit should be set up, for at least the first two or three years, to provide advice, clarification and to help ensure consistency;
- c) Adequate training must be made available to local authorities at minimal cost.

2. Resource Implications of Implementation

Local authorities will be required to provide resources for

- establishing and carrying out the strategy for inspection;
- survey, assessment and remediation works on particular sites, using consultants where the local authority does not have the necessary skills in-house;
- legal and administrative matters.

It is essential that funds are made available for this work. The Supplementary Credit Approval Scheme is unlikely to be either adequate or appropriate to deal with the needs of local authorities. For example, it is understood that SCA would only be available to carry out additional survey work and remediation of sites already identified as being "Statutory Contaminated Land". The SCA scheme would not be available for survey works on sites where the local authority was trying to establish whether or not a site was statutory contaminated land. Local authorities would therefore be expected to fund this work from within existing sampling budgets; this is clearly not acceptable as the cost of investigating even one site may be substantially more than a local authority's total sampling budget.

3. Receptors of Harm

There is serious concern at the restricted definition of receptors; it is clear from the draft guidance that it is not intended to afford any protection at all for parks, landscaped areas, gardens and similar locations. Such a position appears to be far from what was promised when the *Environment Act* was passing through Parliament. A change to the guidance in this respect is considered necessary.

4. Environment Agency

Cooperation and liaison between local authorities and the Agency will obviously be of considerable importance. It is hoped that the Agency will give high priority to any sites identified as statutory contaminated land, especially residential sites as there will be strong pressure from residents to resolve matters as soon as possible as blight and safety will be foremost in their minds.

NSCA COMMITTEE FEEDBACK

The meeting of the Society's **Council** in December heard that following the reorganisation of local authorities in Wales and Scotland, virtually all the newly created authorities had joined NSCA. Plans to restructure the Society's governing body and committees were discussed, with an agreement to circulate a consultation paper* on the subject to Divisions. Further consideration will be given to this at the March meeting of Council. The Council also agreed that the Society should become a member of the newly-formed European Federation of Clean Air Associations (EFCA).

Alan Blythe has agreed to coordinate a small working group reporting to the **Parliamentary and Local Government Committee** to develop Society policy on radon. A draft policy paper* should be available for comment shortly. The P&LG Committee will also be producing a response to the Environmental Manifesto for Local Government*, circulated jointly by the local authority associations.

The **National Noise Committee** hopes that its Code of Practice for Noise from Oval Circuit Motor Racing* will be approved by DOE following the incorporation of some detailed amendments suggested by the Department. John Gledhill and Alan Watson are coordinating the changes. Meanwhile Martyn Bailey and John Clegg are involved with rewriting the Code on Off-Road Motorcycle Noise, which is to be retitled the Code of Practice for Noise from Off Road Sport. NSCA is also discussing with DOE the idea of another Noise Awareness Day - this time in the summer when outdoor noise is a particular problem. This has now been agreed for 23 July.

The **Technical Committee** noted that the draft National Air Quality Strategy sets a tighter air quality standard for SO₂ than the equivalent recommended by the World Health Organisation, and raised its concern with DOE. NSCA has now received clarification* from DOE on the evidence which supports this position.

* Documents available from NSCA on request.

REPORTS

Reducing Road Transport Impacts The Opportunities for Business

Celia Greaves

Centre for Exploitation of Science and Technology

Companies which address their corporate transport operations can benefit from both reduced costs and reduced environmental impact. This Paper highlights the options available.

Introduction

The past few decades have seen a rapid increase in car use, and this trend is set to continue. Whilst the increase reflects the important contribution which cars and other forms of road transport make to individual and corporate transport, there is growing recognition that predicted trends are unsustainable, both in terms of congestion and environmental quality. Consequently, road transport is moving up both political and public agendas, as new ways of managing demand are being sought.

An examination of current and emerging policy and legislation reveals a number of major trends in Government and EC policy on transport and the environment. At EC level there is increasing emphasis on the need to internalise the external costs of road transport, and bring costs closer to the user. In the UK, a variety of novel policy options have been either introduced or are under consideration. These include congestion charging, changes in land use planning policy, restraints on employer provided parking in new developments, access restrictions in urban areas, greater powers for road side emissions testing and taxation of employer provided parking.

Such initiatives have significant implications for the corporate decision maker. Internalisation of external costs is likely to result in higher costs of business travel, which should act as an incentive to consider opportunities to reduce such travel. Changes in land use planning policy could have long term effects in terms of siting of new developments and parking provision. Those organisations which recognise issues such as the impact of their location on commuter travel and traffic generation, and the benefits of working with local authorities on matters such as site access, will be better placed to expand and relocate their operations in the future.

Recent research by CEST (Centre for Exploitation of Science and Technology) has highlighted a number of options for organisations seeking to improve the energy

efficiency and reduce the environmental impact of their corporate transport operations. These range from those applicable to company cars through to those seeking to reduce the impact of employee commuting. In many cases the potential for long term efficiency gains or cost savings has been identified. In others, there are initiatives which could be pursued on a cost neutral basis.

Overview of the Options

Company cars comprise a significant proportion of the UK fleet. For organisations with company cars, the opportunities to minimise impacts on both the environment and the bottom line extend from purchasing through to management, and include:

- incorporating fuel efficiency and emission considerations into purchasing/leasing decisions (i.e. addressing whole life costs);
- offering incentives, where appropriate, to users to trade down to a smaller vehicle;
- reducing the availability of free fuel; and
- encouraging the use of alternate modes for business travel.

The practical applicability of these measures is, in reality, constrained by a variety of cultural and financial factors. These encompass prevalent attitudes towards company cars amongst both employees and employers, as well as aspects of current tax arrangements.

Vehicle fuel forms an important raw material for business, and its management should form an essential part of standard operating practice. In the HGV sector, programmes based around a framework of monitoring and targeting have been found to be effective in optimising fuel consumption, enabling businesses to reduce costs and, thus, compete more effectively. Specific programme components encompass vehicle maintenance, driver training and regular feedback, all of which can make an important contribution to reducing fuel consumption.

Much of the experience gained in the HGV sector is also applicable to cars, and there are significant opportunities for fuel savings relating to car based business travel. However, in reality, many organisations do not deal directly with fuel as a raw material. Where drivers are recompensed on the basis of miles driven, rather than fuel used, there is less direct financial incentives to address fuel consumption. Nevertheless, there are a number of less obvious benefits. For example, driver training not only leads to lower fuel consumption, but can also have a significant impact on accident rates. Furthermore, with air pollution due to vehicle emissions receiving increasing public attention, there is the potential for organisations explicitly addressing the issue to raise their profile. Employee relations could also be improved where drivers are helped to reduce their own costs.

For those organisations which do provide fuel for business travel, limited practical experience suggests that cost savings of around 6% could be achieved with the introduction of fuel monitoring. Driver training offers the potential for savings of up to 25%.

There are several technologies currently available which are suitable for corporate use and which could instantly improve the environmental performance of a company's car fleet. These include electric vehicles (in certain circumstances), alternative fuels (such as LPG and CNG) and various "green" fuels (such as City Diesel). The financial impact of introducing these technologies is, in some cases, well documented; in others it is not yet evaluated. Policy and legislative developments could also be relevant to the attractiveness of these technologies for corporate transport in the long term.

Those considering the role of new and emerging technologies in their corporate fleets need to examine the benefits and disbenefits in the context of their own particular situation.

Staff travel plans provide a useful framework for efforts to reduce the impact of staff commuting. Initiatives aimed at promoting car sharing, cycling, walking, the use of public transport and alternative working arrangements can bring benefits to both employees and employer.

Whilst there is some evidence of limited uptake of specific measures in the UK, there are few organisations considering a more cohesive approach to commuter travel.

By addressing the full range of initiatives available, and the interactions between them, employers can design a commuting plan which represents the most effective solution for them and their staff.

US experience suggests that the introduction of a formalised framework requiring employers to develop staff travel plans is unlikely to be an appropriate way forward. Nevertheless, many organisations in the UK, including the CBI, have recognised the value of employers taking an active role in staff commuting.

The costs of commuter plans vary depending on the types of initiatives introduced. For those employers willing to address the issue of employer provided parking, the revenue raised from charges or the funds saved through a reduction in parking requirements can be used to offset support for other measures.

Implications

A preliminary assessment of the implications of improved fuel efficiency has been undertaken. Taking a simple assumption that a reduction in fuel consumption is possible for all car based business and commuting trips, initial estimates suggest that overall UK cost savings of over £700 million could be achieved per year.

Reduced fuel consumption would also result in a decrease in emissions. Using the assumptions outlined above, the potential decrease has been estimated - see Table 1.

It is interesting to note that the UK is committed under the Climate Change Convention to achieve a reduction in emissions of 10 million tonnes of carbon by the year 2000; this is equivalent to 37 million tonnes of CO₂. Notwithstanding the fact that this target is expected to be exceeded, it can be seen that efforts to reduce road transport and, particularly, car based work related trips, could make a meaningful contribution to a decline in national CO₂ levels.

A preliminary comparison of the costs and benefits of the various technologies and techniques available suggests that there is no simple solution for those seeking to reduce the environmental impact and improve the efficiency of corporate transport operations. Perhaps unsurprisingly, there is a broad correlation between costs and benefits. Technologies, such as CNG and bioethanol, appear to offer the greatest potential reductions in emissions. They are also

Table 1: Reduction in Emissions (tonnes per year)

	CO ₂	CO	HC	NO _x	Particula tes
Petrol	2,780,000	32,000	2,200	3,200	150
Diesel	305,000	900	200	1,400	330
Total	3,085,000	32,900	2,400	4,600	480

relatively costly, although it is interesting to note that, whereas the cost for bioethanol lies almost entirely in vehicle running, that of CNG lies mainly in initial conversion. Techniques, such as trip reduction (through a commuter plan), represent a relatively low cost option. Overall, the most appropriate option will depend upon a number of organisational and vehicle use factors.

Conclusions

Whilst there is considerable concern about the growth in road transport, there is much that individual organisations can do to reduce the impact of business travel and

commuting. As the regulatory framework moves forward, with new measures embracing a variety of demand management based initiatives, those organisations which address the issue of corporate transport have the opportunity to enhance their competitive position and improve their relationship with stakeholders.

For further details of CEST's recently published report *Efficient Corporate Transport*, please contact Celia Greaves at CEST, 5 Berners Road, Islington, London, N1 0PW. Tel 0171 354 9942, Fax 0171 354 4301, Email cgreaves@cest.org.uk.

The EC Green Paper on Future Noise Policy A Need for Change?

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A need for changes in the overall approach to national and European noise abatement policy is discussed in an EC Green Paper¹ issued during November 1996. This article discusses the Green Paper and looks at the impact it could have on UK noise abatement measures.

Introduction

The Green Paper would be better titled "Future Environmental Noise Policy" as its brief excludes consideration of workplace noise exposure and noise in dwellings. It does, however, seek to give noise abatement a higher priority and to promote discussion on all areas of environmental noise policy with a clearly stated desire to see a harmonisation of assessment and measurement methods across the Member States.

For over 25 years European Commission (EC) noise "policy" has essentially consisted of legislation fixing maximum sound levels for vehicles, aeroplanes and machines with a single market aim. However, the Green Paper notes that this has not led to significant improvements in exposure of people to environmental noise, particularly from road traffic. Concern is expressed on a number of issues:

- noise levels in "black areas"* have been reduced but the number of people living in "grey areas" has increased;
- continued traffic growth coupled with urbanisation is resulting in a higher level of noise exposure;
- leisure and tourism activities have created additional noise sources;

- the spread of noise spatially (to affect rural and suburban areas) and over time.

Additionally, there are problems associated with unifying assessment of noise exposure because of the different perception and acceptability of noise levels/exposure across the European Union (EU).

Environmental Impact of Noise

Section 2 of the Green Paper examines the impact of noise and relates it to eight general categories of noise sources: road, rail, air, industry, civil engineering, building site activities, recreational activities and outdoor equipment. The latter category includes gardening equipment. Many of these sources are already covered by existing UK legislation, codes of practice and BS or ISO standards.

Road traffic is singled out as the most important noise source, said to account for 90% of the EU exposure to levels greater than 65 dB(A) (80 million people), for whom a significant effect on human health can be expected. The grey category, where people are seriously annoyed, is said to affect 170 million EU citizens. It should be of no surprise therefore to expect recommendations to concentrate on this source.

Overall the trends which cause concern in the future are the predicted doubling of road freight by 2010, a forecast 180% increase in airline traffic and the development of high speed rail links.

* OECD, 1991, Fighting Noise in the 1990s, suggests that "black areas" are those with daytime $L_{Aeq} > 65$ dB, and "grey areas" have a daytime L_{Aeq} between 55-65 dB.

Currently there is much interest across Europe in the polluter pays principle and the use of green taxes, but attaching a cost to noise exposure is a controversial procedure. Because of the difficulties a number of factors are identified in the Green Paper which may enable an economic assessment to be made:

- willingness to pay (for less noise exposure);
- change of market value of properties;
- cost of abatement measures;
- cost of avoidance or prevention;
- cost of medical care and production losses.

Cost estimates vary according to the method used but are typically found to be 0.2 - 2% of GDP. This annual cost to society (over 12 billion ECU) provides the EC with a significant argument for improved noise control measures.

Efficacy of Existing Policies in the EU and Member States

Section 3 of the Green Paper examines existing EC policies and the effectiveness of their implementation. These are summarised in Table 1.

What Levels are Acceptable?

The Green Paper quotes OECD thresholds and WHO guideline values as the starting point for a discussion of acceptable levels in the EU, leading to a restating of the night time L_{Aeq} targets contained in the Fifth Environmental Action Plan (to be achieved by the year 2000):

- to phase out exposure above 65 dB(A);
- reduction in proportion of population exposed to levels between 55 and 65 dB(A);
- exposure in quiet areas should not increase beyond 55 dB(A);

Table 1: Summary of EC Directives

Noise Source and relevant EC directives	Developments	Comments
Road transport 70/157 (as amended), 78/1015 (as amended)	8 dB(A) reduction for individual cars, 11 dB(A) reduction for individual heavy lorries	resulting in only 1-2 dB(A) reduction in road traffic noise exposure because of increased traffic volumes
Rail transport (no directives)	proposed emission limits withdrawn in 1993	legislation currently on an individual country basis
Air transport 80/51, 89/629, 92/14	limit values introduced for take off and landing, noise certificated aircraft, phase out of chapter 2 aircraft by 2002	improvements likely in short to medium term, concern over longer term deterioration
Construction plant & equipment, lawnmowers 79/113, 84/533, 84/534, 84/535, 84/536, 84/537, 84/538, 84/662, 86/594, 86/662	approx. 1-5 dB(A) reduction from specified items; policy has a single market aim.	no guarantee that current approach secures any environmental improvement; proposed new framework directive
Industrial noise 75/442 (as amended), 96/61	new area of EC activity	control of some industrial noise emissions through a permit system.

- a level of 85 dB(A) should never be exceeded.

Most countries have already adopted legislation and guidance which broadly agrees with these figures - e.g. PPG24², and in fact criticism of these figures was made by some countries whose noise climates were already below target levels³.

A New Noise Framework

The EC wishes to see Member States working towards the common goal of a successful noise abatement policy, and suggests action in a number of generic areas to achieve this:

- common noise exposure index to be used throughout Europe (L_{Aeq}) to enable comparability of noise data;
- development of harmonised prediction methods for environmental noise sources;
- development of harmonised measurement methods for environmental noise sources;
- exchange of comparable information on noise exposure between Member States, possibly collected and made available by the European Environment Agency (EEA);
- a framework for the assessment of environmental noise exposure;
- provision of information on noise exposure to the public;
- possible agreement on a limited number of minimum noise target values;
- an obligation to take action to meet these target values.

Achieving the Aims

At present it is unclear exactly how these aims will be achieved - after all this is a discussion paper - but we can draw some conclusions as to where effort may be targeted.

(i) Mapping to assess noise climate and noise exposure

The EC believes that noise mapping has the potential to be an effective and relatively inexpensive tool. Noise mapping combines noise level data with a conventional map, representing the noise levels as coloured bands or contours. This is not a new idea and bands have been suggested in ISO 1996⁴, but the real opportunity is to incorporate other data sources, such as census information, to assess population noise exposure. Noise data can be originated from model prediction or measurements.

(ii) Road transport noise reduction

A number of suggestions are given:

- reduction of tyre/road noise;
- active promotion and funding of low noise surfaces;
- use of vehicle taxation;
- in-use noise testing of vehicles;
- revision of test procedures (e.g. ISO R362);
- consideration of new emission limit values;
- support of relevant research.

(iii) Railway noise reduction

Concern here surrounds the problems associated with high speed rail and freight transport. Apart from the joint bodies representing these sectors suggesting noise emission limits, the Green Paper highlights a combination of:

- economic instruments (e.g. track changes related to emission levels;
- agreements on targets for noise reduction and maintenance of equipment in use;
- harmonised methods for assessment and prediction of railway noise.

(iv) Aircraft

For aircraft noise a reclassification of aircraft types is suggested based upon actual operational noise rather than the current certification method. Greater stringency in emission values, the use of economic instruments and the role of land use planning are also discussed.

(v) Outdoor machinery

The emphasis here is on a proposed directive for 1997 which will include noise limit values for some equipment and introduce noise labelling of machinery as diverse as construction plant, garden equipment and equipment used on refuse collection vehicles. This is seen as part of the drive to improve eco-labelling of products. The OECD have reported that such an approach may create a market for low noise products.

(vi) General actions

The final section of the Green Paper is concerned with those activities which promote exchange of ideas, technology and experience across the EU.

Some examples, such as the LIFE programme, already

involve the UK local authorities to improve and inform land use development and planning, whilst others such as the Telematics Applications Programme⁵ have been used to improve environmental information systems. It is expected that increased use will be made of these sorts of programmes to enhance noise reduction activities across the EU.

This possibility of financial support from the EC may be of interest to local authorities who are considering a more pro-active approach to environmental noise policy.

Concluding Remarks

This is the first attempt by the EC to significantly influence environmental noise policy across Europe. The EC also seem a little unclear as to whether they should initiate a greater involvement in this area of environmental activity. For example, compare this quote from the executive summary of the Green Paper "*The local nature of noise problems does not mean that all action is best taken at local level*" with "*The local impact of noise means that proposing and implementing solutions are essentially local responsibilities*" taken from section 4.1.

As professionals working on a daily basis with noise problems we are all too aware of the influence and effects that noise exposure has upon local communities. We should welcome the opportunity to contribute to the debate and at long last give noise policy the attention it deserves.

The EC is seeking comments on the Green Paper by 31 March 1997. Observations should be submitted to:

The European Commission, DGXI,
"Green Paper on Future Noise Policy"
Rue de la Loi 200
B-1049 Brussels, Belgium.

(NSCA will also be submitting its comments to the EC; NSCA members should contact Malcolm Eames if there are any points which they would like him to incorporate.)

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1. European Commission Green Paper on Future Noise Policy, COM(96) 5430 final, 1996.
2. PPG24, Planning Policy Guidance: Planning and Noise, Department of the Environment, September 1994.
3. Gottlob D, Regulations for Community Noise, Noise/News International, 1995 December, 223-236.
4. ISO 1996-2, 1987, Description and Measurement of Environmental Noise, Part 2 Guide to the Acquisition of Data Pertinent to Land Use (BS 7445: Part 2: 1991).
5. See Clean Air, Vol. 27, January/February 1997, pp 21-23 and this issue, pp 44-47.

Current Development in Environmental Telematics - Part 2

Air Pollution Telematics on the World Wide Web

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This article is the second part of a paper outlining current developments in environmental telematics and is based on research conducted in the spring of 1996. The first part was published in the last issue (January/February 1997) issue of Clean Air.

This research has been part-funded by the European Commission, DG XIII, as part of the Telematics Applications "Telematics for Environment" Programme, project EN 1005.

Air Pollution Telematics on the World Wide Web

The Internet is the most widespread example of a telematic network and as such it has many benefits which can be utilised by environmental telematics projects. Probably the most useful aspect of the Internet is the ease with which up-to-date information can be made available to the public, particularly via the world wide web (WWW or "the web"). With this in mind, a survey was conducted of web sites providing air quality information. Whilst it has been attempted, the survey cannot be regarded as exhaustive. It is also likely to be somewhat out of date by the time of publication due to the rapid development in air pollution telematics and in the massive increase in WWW sites. For instance, since conducting the survey, three new sites have been identified. Unfortunately, they could not be reviewed, but are listed at the end of the references section.

The survey focused on identifying, investigating and evaluating web sites which provide real-time/near-real-time and/or current air quality information. This includes:

- Data updated automatically as and when information is available from on-line monitoring networks (usually hourly);
- Air quality forecasts (usually 24 hours);
- Air quality alerts/warnings (usually 24 hours);
- Very recent air quality information (yesterday, last week) but only if of particular interest, e.g. interesting or innovative presentation or information content.

It must also be mentioned that only English language sites were investigated due to the linguistic limitations of the reviewer.

The World Wide Web (WWW)

The part of the Internet which provides a user friendly graphical interface allowing access to web sites and other Internet resources. Rapid development has meant that there is now access to multimedia services. This is the fastest growing part of the Internet.

Air Quality Web Sites

Considering the proliferation of on-line monitoring networks, there are few web sites which provide direct access to this data. Of those that do, only a minority provide an extensive and user-friendly service. Most sites are run by organisations responsible for air quality monitoring.

When investigating sites three main points were considered:

1. Ease of access to site, and information contained within it.
2. Clarity of presentation and ease of comprehension, particularly how readily understandable the information would be to a person unfamiliar with air pollution terminology.
3. Quality and quantity of information provided, particularly real-time or near-real-time air quality data.

The first problem, which users of the Internet will be familiar with, is finding the information. This report utilised web sites referred to in other references, such as a report on "Environment On-Line" by Tony Reichhardt in Environmental Science and Technology¹, and Internet search engines such as Alta Vista, Excite and Infoseek, as well as word of mouth. Search engines offer an excellent way of getting started, but, it was found that the vast majority of useful addresses were contained in the first few references, after which an awful lot of time could be spent investigating sites which were rarely worthwhile. Most sites were found by following links provided by other web pages, in particular the Ohio EPA Department of Air Pollution Control, Other Air Pollution Related Web Sites² page, which provides links to most states in the US.

Having located a likely looking web site, the next hurdle is to identify which link will lead to air quality data. This may seem fairly straightforward, but it often took a bit of trial and error before the appropriate sections were located. This highlights one of the main features of the web - it is international. What may seem a perfectly obvious signpost to air quality information to a Californian was not

at all obvious to an Englishman. However, as one of the main aims of such web sites is to improve public information and awareness in the locality covered, such problems are less important provided local users find the language readily understandable.

Of the many air pollution related web sites visited, only four contained extensive real-time/near-real-time air quality data. These were:

- The AEA Technology, NETCEN Air Quality site run for the Department of Environment and covering the UK³.
- The South Coast Air Quality Management District covering the Los Angeles (LA) region of California⁴.
- The Pennsylvania Dept. of Environmental Protection (DEP) - Bureau of Air Quality⁵.
- The Austrian Federal Environment Agency, Air Quality Data as part of the State of the Environment in Austria⁶.

The first three are English language sites in English speaking countries, whereas the fourth is mainly in German but with English text to provide a skeleton framework useable by English speakers. As a consequence this report cannot fully assess the services provided by the Austrian site.

The NETCEN site is the most comprehensive in terms of the number of pollutants included (see Table 1). The South Coast Air Quality Management District (SCAQMD)

site, however, has a more extensive selection of other information on air pollution in the LA area and contains more resources. The Pennsylvania Air Quality Bureau also contains extensive information and resources as well as real-time/near-real-time air quality data for several pollutants (see Table 1). The diversity of content in each site varies, due partly to the objectives and remit of the publisher. NETCEN is employed as an air quality monitoring service whereas the SCAQMD and Pennsylvania Air Quality Bureau both have a regulatory role as well as responsibility for monitoring.

Approaches to Real-Time/Near-Real-Time and Forecast Data Presentation

Different approaches have been taken in providing real-time/near-real-time air quality data. NETCEN have used a mainly text-based approach. This enables fast access and is fairly easily understood, although it lacks in appeal. The SCAQMD on the other hand has taken a more graphical approach with icons, tables and buttons aiding navigation around the site. For real-time/near-real-time data a “clickable map” allows selection of an area within the district (see Figure 1); this links to a table displaying the current levels of each pollutant at monitoring sites in that area. A map of this type provides an appealing and instantly recognisable method of navigation (the actual map is in colour); the only problem is that older web browsing software cannot sometimes display this type of information, and that images, especially of this size, take longer to

Table 1: Air Quality Web Site Details

Web Site	Real Time Monitoring						Forecasts	Historical Data	Statistics ♠
	O ₃	NO _x	SO ₂	CO	PM ₁₀	HC's			
NETCEN, UK ³	✓	✓ [@]	✓	✓	✓	✓ [*]	overall air quality	Emissions Data 1970-, Benzene and 1,3 Butadiene last week plots	
South Coast AQMD, Cal, US ⁴	✓	NO ₂		✓	✓		O ₃ , NO ₂ , CO, PM ₁₀	1994, 1995 exceedences etc	470,000 visitors so far, av. 4050 files per day
Federal Environment Agency, Austria ⁶	✓	NO ₂	✓					Last 3 days, week, month. Trends '78-95'	
Pennsylvania DEP - Bureau of Air Quality ⁵	✓	✓ [@]	✓	✓				O ₃ exceedences '95.	536 March '96
Texas Natural Resource Conservation Commission Office of Air Quality ⁷	✓ [@]						Ozone	Any O ₃ data for any site in '96. Annual O ₃ data '72-'95	
Michigan Air Quality Division Air Quality ⁸	✓							Ozone exceedences '93-'96	1000-2000/week
Colorado Air Pollution Control Division ⁹							Air Quality Warnings		
Greater Vancouver Air Quality Index Report ¹⁰	✓	NO ₂	✓	✓	✓ [*]				
Maine Dept. Environmental Protection Ozone Forecast ¹¹							Ozone		27 visitors in last 12 days

♠ These statistics cannot be compared accurately as some refer to the actual air quality data page/s whereas others refer to the site as a whole and may include visits which did not access air quality data.

@ NO and NO₂

% Yesterday's Peak 1-hour measurement for each

♥ Benzene, 1, 3, Butadiene, 25 HC species

♣ NO_x and NOx

* Inhaleable Particles

download. Longer downloading times can become tedious and risk losing the interest of the visitor. This problem may also become more acute as Internet traffic increases and the whole system gets slower due to overloading.

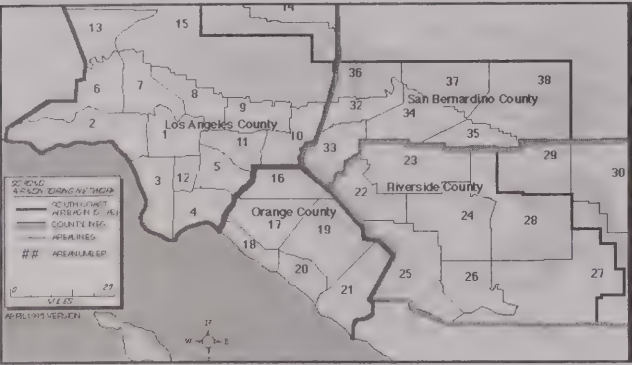


Figure 1: Clickable Map Providing a Link to an Area of Interest

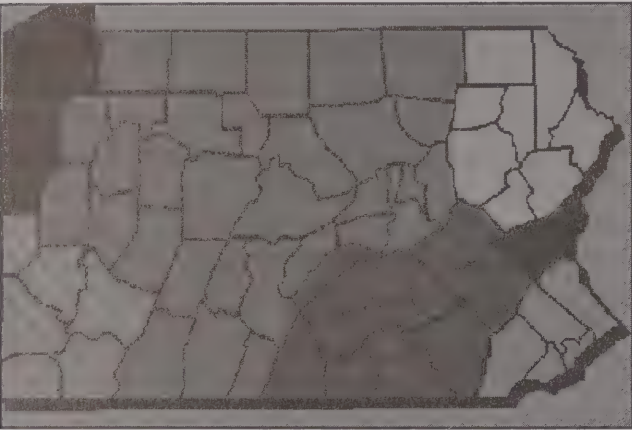


Figure 2: Pennsylvania Bureau of Air Quality Area Forecast Selection Map

The SCAQMD provides an alternative non-graphical list of sub-regions, thereby by-passing the problem if so desired. The Pennsylvania Bureau of Air Quality site also provides two options. Visitors can either use a clickable map (Figure 2, shown because of the clear graphical presentation - originally in colour) to select a region for which pollutant levels and current PSI (see Table 2) for the last hour are displayed in a well-presented table; or visitors can access the latest pollutant levels (5 min. average updated every 5 mins) at all sites presented in one large table.

Table 2: Pollution Standard Index (PSI), USA
(all air pollutants are rated on the same scale)

PSI Description	
0-50	Good
51-100	Moderate
101-200	Unhealthful
138-200	Ozone only health advisory alert
201-275	Very unhealthful
> 275	Hazardous

Another difference between NETCEN and SCAQMD is that the first provides the data categorised by pollutant, whereas the second uses sub-regions; i.e. at NETCEN a list of single pollutant levels is given for all the sites in the UK; at the SCAQMD a list of all pollutants is given for a single sub-region. The SCAQMD covers a far smaller area than NETCEN and so has a more intensive network, enabling area-based categorisation. NETCEN on the other hand maintains a national network which not only covers a far larger area, but also contains a more diverse range of conditions.

Interestingly, with air quality forecasts the above two sites have swapped methods to a large extent. NETCEN provide a map of the UK showing overall predicted air quality (see Figure 3), whilst the SCAQMD provide forecasts in tabular form.



Figure 3: NETCEN Air Quality Forecast

The NETCEN forecast is simple and should be easily understood; however there is some degree of uncertainty as to where the boundaries between each region lie. SCAQMD have gone to the other extreme with a long table giving the predicted peak level for each pollutant and the maximum PSI (see Table 2) in each sub-region. This was difficult to understand and unappealing.

What seems most apparent from the sites discussed, and from other sites visited, is that there is no consensus on the most effective way of presenting real-time/near-real-time and forecast air quality data. In fact it appears that the method and style of presentation depends more on the type of information available and the way in which it is received from the source than it does on increasing accessibility to the public. That is not to say that designers of these sites have not tried to make the information as comprehensible and attractive as possible, but it does highlight the fact that it seems little research has been done in investigating what the public want and need, that many of these sites have only recently been established, and that virtually all of them are undergoing development. In the month during which this survey was conducted many of the sites were altered and updated.

Accessing Historical Data

Few sites provided extensive historical data. Of those that did most were annual report summaries, examples of typical trends or pollution episodes. Those that seemed most useful provided a searchable database for which data could be obtained for pollutant/s over certain time periods. The Austrian⁶ site enabled selection of data, presented as a graph, for each monitoring site. For each pollutant a graph showing the levels over the past three days, week or month could be chosen. The Texas Natural Resources Conservation Commission, Office of Air Quality⁷ provides a searchable ozone database where data on any timespan in 1996 can be accessed for each monitoring site; for previous years annual data can be obtained for each site back to 1972. These two examples are rather limited but do indicate the potential for interactive data provision.

General Air Pollution Information on the Web

Many of the sites referred to above have information on air pollution, including: sources, chemistry, effects, and control options and technology. They range from short, straightforward text descriptions to quite lengthy explanations using graphics to enhance the appeal and improve understanding. One of the sites which uses graphics almost exclusively is that of the Wilson Group at the University of California at San Diego (UCSD)¹². Whilst these graphics look great, they take so long to download that unless a visitor has a high speed link, the chances are that they will get bored long before learning anything. Pure text on the other hand can also be boring, and less effective than pictures. There is no doubt a balance between the two, where clear explanations, coupled with simple, clear and interesting graphics, provides effective communication.

References

1. Reichardt T. (1996). Environment On-Line, A guide to Internet Resources. *Environmental Science and Technology* **30**, 76A- 81A.
2. Ohio Environmental Protection Agency, Department of Air Pollution Control, Other Air Pollution Related Web Sites, <http://www.epa.ohio.gov/dapc/page/other.html#other>
3. AEA Technology, National Environmental Technology Centre (NETCEN) Air Quality Information Home Page, <http://www.aeat.co.uk/products/centres/netcen/airqual/welcome.html>
4. California South Coast Air Quality Management District WWW Home Page, <http://www.aqmd.gov/>
5. Pennsylvania Dep, Bureau of Air Quality Home Page, <http://www.dep.state.pa.us/dep/deputate/airwaste/aq/default.htm>
6. Austrian Federal Environment Agency Air Quality Information Home Page, <http://www.ubavie.gv.at/info/emi/luft.htm>
7. Texas Natural Resource Conservation Commission Office of Air Quality, <http://www.tnrcc.state.tx.us/air/monops/>
8. Michigan Air Quality Division Air Quality Home Page, <http://www.deq.state.mi.us/aqd/>
9. Colorado Air Pollution Control Division Home Page, http://www.state.co.us/gov_dir/cdphe_dir/ap/aphom.html
10. Greater Vancouver Air Quality Index Report, <http://www.gvrd.bc.ca/air/bro/aqindex.html>
11. Maine Dept Environmental Protection Ozone Forecast Page, <http://www.state.me.us/dep/ozone.htm>
12. Air Pollution information from Wilson Group, <http://www-wilson.ucsd.edu/education/airpollution/airpollution.html>

Air Quality Web Sites found or started subsequent to the survey:

- Local info: Air quality report for Middlesbrough (seems to be stuck in July 1996): <http://www-scm.tees.ac.uk/local/airrept.html>
- South East Institute of Public Health (SEIPH) Air Quality Data for London region. A comprehensive text and tabular report containing current levels of pollutants for a number of London monitoring sites as well as yesterday's air quality; <http://www-seiph.umds.ac.uk/envhealth/table.htm>
- Cambridge City Air Quality Monitor. Displays a colourful histogram of hourly averages for the last 24 hours, updated hourly for NO₂, CO, PM₁₀ and O₃: <http://www.io-ltd.co.uk/ccq.html>

UPDATE

UK RATIFIES SULPHUR PROTOCOL

On 17 December 1996, the United Kingdom became the fifth country to ratify the UNECE Second Sulphur Protocol - The Netherlands, Norway, Sweden and Luxembourg are the other countries to have done so. Under the Protocol the UK has agreed to reduce national annual emissions of sulphur dioxide by 50% by 2000, 70% by 2005 and 80% by 2010, all compared with 1980 levels.

Also on 17 December, the Government published its *National Strategy for Reducing National Emissions of Sulphur Dioxide*, which outlines its policy and programmes for meeting the UK's Commitments under the Protocol; changes to the Large Combustion Plant National Plan, which ensures compliance with targets set under the EC's 1988 Large Combustion Plant Directive, were also announced. These were reported on in *Clean Air*, vol. 26, no. 3/4 and vol. 27, no. 1.

AIR QUALITY

A draft of *The Air Quality Regulations 1997* was published in November 1996: these prescribe the AQ objectives to be achieved by 2005 (as set out in the Strategy - see briefing circulated with *Clean Air*, Autumn/Winter 1996). The Regulations will require county councils to respond to a district council's request within nine months of first being consulted under section 86(3); this specifies that where a district council is preparing an AQ action plan, county councils are required to submit proposals to the district council on the action it will take in pursuit of the AQ objectives. The Regulations will apply in England, Scotland and Wales.

A number of consultation documents relating to local authorities' duties in respect of LAQM were published in December 1996; they include: LA circular on AQ and traffic management; LA circular on AQ and land use planning; Information paper on the general principles of reviewing and assessing AQ; Review of LA powers.

See also NSCA news section for NSCA comments on the EPAQS recommendation for nitrogen dioxide standard.

ROAD TRAFFIC REDUCTION BILL CLEARS COMMONS HURDLE

In a move thought to signal a historic change in Government transport policy, the Road Traffic Reduction Bill won an unopposed Second Reading in the Commons on 24 January. The Bill, which is supported by the NSCA, would require local authorities to set targets for reducing traffic or projected traffic growth (based on 1990 levels) by

the years 2005 and 2010, and to draw up plans for how this will be achieved.

In return for the Government's tacit support, Don Foster the Liberal Democrat MP who introduced the Private Members Bill agreed amendments removing the requirement to set national traffic reduction targets. *"The Road Traffic Reduction Bill now stands a significant chance of becoming law, and if it does it will be one of the most important pieces of transport legislation in the UK. For the first time the Government will recognise that it needs to tackle the problem of increasing traffic growth rather than trying to accommodate it."* said Don Foster. The Bill will now go to Committee.

DOE RESEARCH FUNDING

The Department of Environment has allocated £28.877 million for environmental protection research in 1997/8. The objective of the research programme is to provide the scientific data on which the Department's environmental policy and statutory duties can be developed. A substantial part of the programme is for long term monitoring of the state of the environment. During 1997/8 increased emphasis will be given to research which supports the requirements of the *Environment Act 1995* in producing a National Air Quality Strategy and in reviewing its provisions. This includes:

- expanding the urban monitoring network;
- setting clear national standards and reduction targets for all the main pollutants;
- integrating air quality considerations with other policies; and
- promoting a balanced approach to emissions control.

Research should also ensure that the risks to human health and the environment from exposure to certain chemicals and pesticides are thoroughly investigated and assessed.

Further information about the research programme and projects planned for 1997/8, and an invitation to bid, is contained in a Newsletter which can be obtained from Ken Nulty, Room A130, DOE, Romney House, London SW1P 3PY; fax: 0171 276 8430.

ALKALI ACT REPEALED

On 16 December, one of the country's oldest pieces of environmental legislation disappeared from the statute books. The *Alkali Act 1906*, which can trace its ancestry back to the first *Alkali Act* of 1863, has become redundant

following full implementation of integrated pollution control and local air pollution control introduced under Part I of the *Environmental Protection Act 1990*.

The following associated legislation is also repealed:

- *The Health & Safety (Emissions into the Atmosphere) Regulations 1983 and 1989 amendment Regulations*
- *The Control of Industrial Air Pollution (Registration of Works) Regulations 1989*
- section 1(1)d and section 5 of the *Health & Safety at Work etc Act 1974*
- the reference to the Alkali Act in section 79(10) of the EPA 1990.

ENVIRONMENT AND HEALTH

Detailed proposals to include environment as a new Key Area in the Health of the Nation Strategy were announced by the Environment Secretary in November. It is proposed that individuals and groups should be mobilised to work together to improve environmental health with objectives and targets being set for five areas:

- **outdoor air quality:** *Objective* - to render emissions to outdoor air harmless to health and reduce ambient concentrations of air pollution to levels where no significant effects on human health occur. *Target* - achieve AQ objectives in National AQ Strategy.
- **indoor air quality:** *Objective* - reduce mean levels of key air pollutants in homes and ensure that everyone can have good AQ in their homes. *Target* - ensure advice on health effects of key indoor pollutants and means of avoiding or minimising exposure is widely available; achieve downward trend in key indoor pollutants by 2003.
- **radon:** *Objective* - reduce incidence of lung cancer from exposure to radon in homes. *Target* - by 2000 identify at least a further 30,000 homes above the radon action level, and encourage 10,000 owners of homes above the action level to take remedial action.
- **noise pollution:** *Objective* - minimise noise pollution from all sources to improve local environmental quality and minimise risks to health. *Target* - increase proportion of domestic noise complaints to local authorities which are satisfactorily resolved by 25% by 2000 on 1996 baseline.
- **lead in drinking water:** *Objective* - reduce high levels where these occur. *Target* - continue to reduce levels of lead in drinking water, so that zonal levels by 2005 are generally no more than half the current standard.

SUSTAINABLE DEVELOPMENT

Statutory Ministerial Guidance on Sustainable Development (as required by s.4 of the *Environment Act 1995*) was published in November 1996. This includes

advice on the contribution towards the objective of achieving sustainable development which Ministers consider the Agency should make in the discharge of its functions. Similar guidance is to be issued to the Scottish Environment Protection Agency.

LOCAL AGENDA 21

LABEL 21, a new scheme which aims to encourage more local authorities to forge links with local businesses as part of the Local Agenda initiative is awarding grants to councils to pump, prime and facilitate local schemes.

Seven local authorities have each received £2,000:

- Bath & North East Somerset - to promote links between the Council and primary food producers;
- Blaby DC - five stage partnership which includes help with audits, green business awards and developing local indicators;
- Canterbury City - next generation environmental audit and 6th form placements in local businesses to carry out audits;
- Nottinghamshire CC - commuters club newsletter to promote green commuting;
- South Hams DC - green tourism;
- LB of Sutton - environmental telecentre/local telematics exchange;
- Thamesdown DC - sustainable housing development.

Three other councils were each awarded £1,000:

- Oadby & Wigston BC - for a business and environment pledge scheme;
- St. Edmundsbury BC - business envirodisk with advice on environmental management, forums, initiatives, etc.
- Stafford BC - pilot industrial estate LA21 for Stafford.

For further details contact Jane Bradford or Jane Morris at The Local Government Management Board, Tel: 0171 296 6529.

PG NOTES ON PETROL STORAGE

PG notes relating to the storage, loading and unloading of petrol at terminals and unloading and storage of petrol at service stations (PG 1/13(96) and PG 1/14(96) respectively) have now been published; they are available from The Stationery Office (formerly HMSO).

BRITISH STANDARD BS 7750

BS 7750 (Environmental Management System) is to be withdrawn on 31 March 1997; companies will instead be certified to International Standard ISO 14001. This standard has still to be formally approved by the European Commission as being equivalent to certification under the EMAS Regulation.

PROMOTING ENVIRONMENTAL MANAGEMENT

The Environmental Industries Commission has launched a campaign to encourage the use of environmental management by British industry; this follows a survey which revealed that while there was unanimous belief that implementing environmental management was of benefit to companies, more help was needed on training, auditing and green procurement. As well as these issues, the EIC's new Environmental Management Group will also focus on education, awareness raising, environmental information and reporting and environmental management system standards.

For more information contact EIC's Director, Adrian Wilkes on 0171 624 2728.

WATER SKIING & NOISE CODE

The British Water Ski Federation is consulting on a revised version of its 1989 code of practice. Once finalised, the Federation will require all affiliated clubs to conform with the code; clubs wanting to affiliate to the Federation will be required to conform to the code within two years. The Federation also plans to submit the Code to the Department of Environment for approval under the *Control of Pollution Act 1974*.

The main aims of the code are to provide guidelines for avoiding significant impact from water skiing noise on the surrounding community for both existing and new sites. A method of assessing the noise from water skiing sites where problems or complaints have arisen is given. The code also provides advice on course layout, hours of operation, screening, public address systems and cars and car parking.

For further information contact the British Ski Federation at 390 City Road, London EC1V 2QA; tel: 0171 833 2855; fax: 0171 837 5879.

HONOUR FOR NOISE CAMPAIGNER

Valerie Gibson, founder of the Right to Peace and Quiet Campaign and of the Noise Network (see last issue of *Clean Air*) was made an MBE in the New Year's Honours List.

PACKAGING REGULATIONS DELAYED

A number of amendments have been made to the proposed regulations including:

- the regulations will be phased in beginning with larger businesses;
- registration with a formal compliance scheme or with the Environment Agency or SEPA and for the provision of data will now be summer 1997; (it was originally planned that the Regulations should be finalised for implementation in April)
- UK national recycling target for each material for 1998-9 to be 7%, in 2000 to be 11% and in 2001 16%; overall recovery targets for the same years amended to 38%, 43% and 52%.

CONTAMINATED LAND

Draft Regulations covering the following were published in November 1996: * special sites; * form and content of remediation notices; * appeals; * compensation for the granting of rights; * remediation registers. Consideration is being given to consolidating all or some of the drafts into a single set of Regulations. The drafts cover England, Scotland and Wales.

LITTER

The *Litter (Fixed Penalty) Order 1996*, which came into force on 1 January 1997 increases the fixed penalty fine for dropping litter to £25 from £10.

OPEN CAST COAL EXTRACTION

Health Effects on Children

Although there has been speculation about the influence of particulates emitted from opencast coal mining on the health of nearby populations, little direct evidence exists. Indirect lines of evidence from epidemiological studies on respiratory morbidity following exposure to ambient particulates, occupational studies among opencast coal workers and quarryworkers, and in vitro studies do, however, all point to an association.

Until recently only one study has addressed the question of opencast coal extraction and health effects directly, when GPs in South Wales expressed concern about the increased number of asthma episodes near a new opencast site*. Given the public interest this study helped to generate, researchers at the University of Newcastle upon Tyne felt a more rigorous study was necessary, and designed a study, not only to add to the public body of knowledge on the health of populations living close to opencast coal sites but also to inform planning and resource decisions in the future. The study design provides a unique opportunity to specifically analyse the health effects of a defined local dust source which will be characterised using the "fingerprinting" method of determining the source of dust. This is a tried and tested method around land reclamation/opencast sites.

The study, designed by the Department of Epidemiology and Public Health at the University of Newcastle has been modified for use within Torfaen County Borough, but fundamentally it is the Newcastle opencast study design with additional dust monitoring. The objectives of the study which is expected to begin in the spring of 1997 are:

- To compare the health, specifically respiratory morbidity, of children living close to a land reclamation scheme involving opencast coal mining, with a socio-economically comparable control population some distance away.
- To compare air quality criteria with the potential to affect the health of the local population at a site close to

a land reclamation scheme involving opencast coal mining, with a site some distance away.

Results from the study are not expected to be published until 1999. For full details of the research study and the methodology to be used, contact: Ms J.A. Tate, Research Officer, Torfaen County Borough, County Hall, Torfaen, NP44 2WN.

* Temple J.M.F. & Sykes A.M. *Asthma and Opencast Mining*, BMJ, 1992, 305:396-397.

COAL BAN IN AGRA, INDIA

More than 290 coal and coke based industries which surround the Taj Mahal have been ordered by the Supreme Court in India to close within a year. The move follows concern that the Taj Mahal, one of India's main tourist attractions, is showing increasing signs of decay and disintegration as a result of pollution from the surrounding industries. The Court order bans delivery of coal and coke to the area from 30 April and also establishes a "green belt area", within which certain industries will be banned, unless they switch to gas.

Whether the Order will be fully implemented remains to be seen, not least because of the costs involved: the Order requires industries relocating outside the green belt area to pay employees a year's pay as compensation for moving and give those employees who do not wish to relocate 6 years' pay. The State Government of Uttar Pradesh is charged with finding new sites for relocating industries and must bear the cost of relocation. (*source: The Times, 31.12.96*)

NSCA Spring Workshop 1997

Tuesday 15 and Wednesday 16 April

Milton Hill Training Centre, Abingdon

Air Quality Management - preparing for action

Local authorities are expected to commence their new duties under Part IV of the 1995 Environment Act on April 1st. This workshop will give a solid grounding in the initial steps necessary to prepare for action.

Guidance is being developed in the light of work undertaken by "first phase" authorities. This is an opportunity for air quality specialists to learn of the detailed plans for air quality management, to share experience to date, and contribute to the development of guidance, policy and training.

The Workshop will be of particular interest to local authority environmental health officers and planners, environmental consultants and other air quality specialists.

The fee for the Workshop, including meals and overnight accommodation on Tuesday 15, is £225.00 + VAT for NSCA members and £315.00 + VAT for non-members. Delegates will receive preprints/abstracts of available papers.

For a copy of the workshop brochure please contact NSCA

136 North Street, Brighton BN1 1RG

Tel: 01273 326313

Email: admin@nsca.org.uk

Fax: 01273 735802

MEMBERS' NEWS

Firstly, a welcome to organisations which have joined NSCA recently - including **CERC, Air Quality Consultants, CSV Environment, UK Petroleum Industry Association** and **Tesco**, plus all those local authorities from Scotland, Wales, Cleveland and Avon who have rejoined following reorganisation. **Neville Parkinson** and **Joe Storer** are two familiar names taking up individual membership after retiring from public service.

In December members of the **Northern Ireland Division** enjoyed a presentation from NSCA President Dame Barbara Clayton at the University of Ulster in Belfast. Dame Barbara's talk on health and pollution ranged over the effects of mineral fibres, fuel additives and fine particles. This prompted a lively debate on indoor air quality and energy issues. Copies of Dame Barbara's presentation are available on request from NSCA.

Making waste work for you - developing BPEO for waste disposal was the title of a well-attended training seminar organised by NSCA in association with the Institute of Wastes Management and the Environmental Services Association. The seminar covered the logistics of waste management and the environmental, economic and social costs options for its separation, treatment and disposal. A summary of the meeting and the policy implications arising from the discussions will be included in the next issue of *Clean Air*.

The **South West Divisional** meeting in December provided an opportunity for members to bid farewell to outgoing Secretary General Tom Crossett. Chairman Keith Horton made Tom a presentation of Bristol blue glass.

A hundred delegates converged on Rangers Football Stadium for a **Scottish Division** seminar on Transport and Air Quality Management. Speakers included Joan Fraser of the Scottish Office, Brian Etheridge of DOE and Tim Brown of NSCA.

A report on the local impact of power station emissions has been produced by Dr Duncan Laxen of **Air Quality Consultants for National Power** and **PowerGen**. Titled *Generating Emissions?* the report concludes that although generating stations occasionally cause rapid increases in local air pollution, exceedances of air quality standards will be infrequent - less than 0.5% of the time in a year at any one location. Available from National Power, Whitehill Way, Swindon SN5 6PB, cost £10.

Middlesbrough Council is one of six local authorities who will be piloting roadside vehicle emission testing powers, including spot fines. According to Cllr John Jones

"there has to be some sanction for the road user who flouts the regulations and pollutes the atmosphere, but we also have to concentrate on educating people".

The latest output from **Southwark Council's** "Air Aware" initiative is a multi-media CD-ROM with information and video clips of air quality issues. David Solman, the borough's Ecology Officer is shown demonstrating the package. Meanwhile the original Air Aware Exhibition is touring the UK.



Knowsley Council has launched a project aimed at persuading local industry to improve environmental management. Grants of up to £5,000 will be available to companies to help with energy efficiency, waste minimisation and compliance with legislation. The initiative is funded by the single Regeneration Budget and organised in association with March Consulting.

Elsewhere...

Delegates to the winter meeting of **IAPSC** (usually referred to as the "Christmas Shopping" meeting thanks to its timing and Oxford Street venue) were treated to a presentation from DOE's Tim Barraclough on local

authority responses to the draft National Strategy. An impressive 200 of the 500 responses to the NAQS were from LAs, and showed broad support for the general principles of the Strategy. One strong message was the need for more resources and guidance, a call at least partly answered by the release of a number of consultation papers and draft guidance, and a promise of over £11M in supplementary credit approvals for air quality management.

Many IAPSC regulars also attended a DOE Conference on Local Environmental Management the following week. Gavin Tringham from **Birmingham CC** asked a question which NSCA has also been pondering: what happens to Government projections of future traffic pollution if catalytic convertors don't have the predicted impact? With catalysts now on a third of all cars, monitoring in Birmingham (and elsewhere) has yet to show the anticipated improvement. "All in good time - it's still too early to see the catalyst effect" was the reassuring DOE response. We'll see.

Forthcoming dates for your diary...**Environment Week** is 10-18 May, **Green Transport Week** is 14-22 June, **National Car-Free Day** is 17 June, **Noise Awareness Day** is 23 July.

We *did* promise to desist from further photo-opportunities featuring politicians with gas-powered vehicles, but couldn't resist one last offering. Who *is* that bloke with Roy Gardner of **British Gas**?



Some of the finest minds in science have been working on new technologies which will improve polluted air. One example is the **catalyst-coated car radiator** that actively cleans the air passing through it. BBC radio recently contacted NSCA to comment on a titanium-coated paving slab, which its Japanese inventor claimed would produce **pollution-eating pavements**. Sounds a great idea; pavements which absorb litter and dog poop can't be far behind.

Finally, we have to disagree with the Government view that there is no role for local authority control of low-level ozone in air quality management areas. It is well known

that ozone is wiped out by other reactive pollutants, especially nitric oxide from car exhausts. The obvious answer is for local authorities to encourage **badly-tuned clapped-out old bangers** into ozone hotspots, possibly with road pricing measures to deter ozone-friendly catalyst cars and diesels. That should do the trick.

NSCA FACT SHEETS

Fifteen detailed A4 information sheets.

1. Summary of Air Quality Standards

Air quality standards set by the EU, US Environmental Protection Agency, World Health Organisation and the UK.

2. Emission Trends in the UK

A summary of past and current emission levels of major pollutants.

3. Stratospheric Ozone

Information on the destruction of the ozone layer and the measures being taken to protect it.

4. Tropospheric Ozone

Information on ground level ozone pollution.

5. Vehicle Emissions - EU Directives

A guide to current EU legislation.

6. Incineration

Information on waste incineration, pollution emissions and legislation.

7. Pollution, Nuisance and the Law - What You Can Do

Information on the steps you can take if bothered by nuisance.

8. Low Frequency Noise

An overview of the problem of low frequency noise.

9. Aircraft Noise

A look at the legislation governing aircraft noise.

10. Minimising Neighbour Noise

Illustrated factsheet listing simple measures to help avoid causing noise disturbance to neighbours.

11. Training and Qualifications

Information on the options available and sources of information for those wishing to work in environmental protection.

12. Sustainable Development

The concept of sustainable development and its incorporation in UK and international policies.

13. Particles - PM₁₀

Sources, health and environmental effects of particle pollution.

14. Clean Air - Where is it?

Information for those concerned about the quality of air where they live.

15. Asthma and Air Quality

An overview of the relationship between air quality and asthma.

Up to three copies free on receipt of an SAE, complete set £6.00. 50 copies of Factsheet No. 10 or No. 15, £10.00. Available from -

NSCA, 136 North Street, Brighton BN1 1RG

FUTURE EVENTS

10-11 MARCH - Pesticides and their Impact Upon the Aquatic Environment

A comprehensive overview of the subject will be presented and the impact of individual pesticides on surface and ground waters discussed.

Venue: Radisson SAS Portman Hotel, London W1.

Details: Tiffany Goubard, IBC UK Conferences, Tel: 0171 453 2072.

10-12 MARCH - Industrial Air Pollution Monitoring

Short course organised by University of Leeds, Department of Fuel and Energy, focussing on gaseous and particulate emissions and current techniques for monitoring.

Venue: Westwood Hall, Leeds.

Details: Jamie Strachan, Fax: 0113 233 2511. Email: shortfuel@leeds.ac.uk

11 MARCH - Transport of Hazardous Wastes

One day course for those involved at any stage in the chain of hazardous wastes transport; will focus in particular on new regulatory requirements.

Venue: Loughborough University.

Details: Rachel Lindley, Centre for Hazard & Risk Management, Loughborough University, Fax: 01509 223991.

12 MARCH - Hazardous Waste Management

One day course covering recent developments, including new special waste legislation, contaminated land and landfill tax.

Venue: Loughborough University.

Details: Rachel Lindley, Centre for Hazard & Risk Management, Loughborough University, Fax: 01509 223991.

17-21 MARCH - Human Health and the Environment

Short course organised jointly by Robens Institute and Farnborough College of Technology offering post graduate training for environmental management and environmental health professionals. (Note: this is also one of the modules of a part-time modular course - for full details contact the Course Coordinator.

Venue: University of Surrey.

Details: Ms Jennie Lynch, Tel: 01483 259935.

7-8 APRIL - International Sustainable Development Research Conference

This third annual conference aims to bring together an international interdisciplinary audience to look for solutions to many of the issues connected with sustainable development.

Venue: The Manchester Conference Centre.

Details: ERP Environment, Fax: 01274 530409.

7-9 APRIL - Industrial Air Pollution Monitoring

Short course covering: correct instrumentation for compliance with legislation; gaseous and particulate emissions, extractive sampling and in situ methods. Principles and practicalities of particle sampling; particle size analysis; smoke and dust meters; gas sampling and sample conditioning; infra-red and UV/visible optical methods; electrochemical devices; methods for VOCs and also for PAH and dioxins; and much more.

Venue: University of Leeds.

Details: Jamie Strachan, Department of Fuel and Energy, University of Leeds. Tel: 0113 233 2494; Fax: 0113 233 2511.

7-11 APRIL - Spring Workshops: Industrial Environmental Management

Three separate workshops: Air Quality Management - 7-8 April; Environmental Legislation - 9 April; Industrial Water and Waste Management Systems - 10-11 April.

Venue: Aberdeen, Scotland (although training workshops can be delivered elsewhere in the UK or overseas and tailored to requirements)

Details: Brian Clark, Director and Professor of Environmental Management and Planning, Centre for Environmental Management and Planning, Tel: 01224 414200; Fax: 01224 414250.

13-17 APRIL - Air Pollution in the 21st Century

Convened under the auspices of the US-Dutch bilateral cooperation agreement concerning environmental matters, the symposium will evaluate the current status of air pollution and focus on the likely major air pollution problems of the next century.

Venue: Noordwijk, The Netherlands.

Details: Mrs O. van Steenis, Tel: +31 30 274 2970; Fax: +31 30 274 4436.

18-19 APRIL - Chimney Works 97

Annual trade show and programme of technical lectures during the first day.

Venue: Moat House, Bolton, Lancs.

Details: National Association of Chimney Sweeps, Fax: 01785 811732.

10-18 MAY - Environment Week

14-22 JUNE - Green Transport Week

23-27 JUNE - Environmental Management and Auditing

Short course organised jointly by Robens Institute and Farnborough College of Technology offering post graduate training for environmental management and environmental health professionals. (Note: this is also one of the modules of a part-time modular course - for full details contact the Course Coordinator.

Venue: University of Surrey.

Details: Ms Jennie Lynch, Tel: 01483 259935.

30 JUNE - 3 JULY - Engine Emissions Measurement

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Venue: University of Leeds.

Details: Jamie Strachan, Department of Fuel and Energy, University of Leeds. Tel: 0113 233 2494; Fax: 0113 233 2511.

22-23 SEPTEMBER - Incineration of Municipal Waste with Energy Recovery

Short course to provide an introduction for all those considering the incineration option for the disposal of municipal solid waste. To provide detailed coverage of the incineration process and associated problems for those already involved in incineration. Specialist lectures on the theory and practice of incineration including combustion, incinerator design, refractories and pollution as well as practical experiences of incineration of municipal waste.

Venue: University of Leeds.

Details: Jamie Strachan, Department of Fuel and Energy, University of Leeds. Tel: 0113 233 2494; Fax: 0113 233 2511.

11TH WORLD CLEAN AIR & ENVIRONMENT CONGRESS

South Africa, September 1998

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This Congress, which is being organised by the National Association for Clean Air of South Africa, will take as its central theme the need to place environmental protection in the wider context of economic and social development, with particular emphasis on collaboration between the developed and the developing world. Papers for oral presentation or poster sessions are invited on the following topics: social/psychological aspects; indoor; global; environmental management systems; energy; sustainable development; and physical aspects.

Abstracts (max. 300 words) must be submitted to national programme committees by 31 March 1997.

For the UK, papers should be submitted to:

Richard Mills, Chairman of the UK Programme Committee

NSCA, 136 North Street, Brighton BN1 1RG.

Fax: 01273 735802

For further details and a copy of the Call for Papers, please contact Ms Wendy Ashton at NSCA, Tel: 01273 326313.

FORTHCOMING NSCA EVENTS

Tuesday 15 and Wednesday 16 April 1997

Spring Workshop: Abingdon, Oxfordshire
Local Air Quality Management

Wednesday 11 June 1997

Workshop - UK Dispersion Model Users Group
London

Tuesday 17 June 1997

Training Seminar
NEC Birmingham
Transport and Air Quality (*provisional*)

Tuesday 16 September 1997

Training Seminar
NEC Birmingham

Monday 20 - Thursday 23 October 1997

Environmental Protection 1997
NSCA's 64th Annual Conference - Glasgow

Tuesday 18 November 1997

Training Seminar
NEC Birmingham

Tuesday 25 November 1997

Workshop - UK Dispersion Model Users Group
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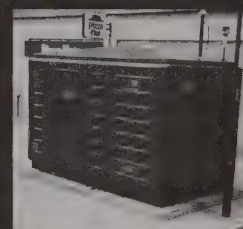
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The National Society for Clean Air and Environmental Protection produces information, organises conferences and training events, and campaigns on air pollution, noise and environmental protection issues. Founded in 1899, the Society's work on smoke control led to the Clean Air Acts. More recently NSCA has been influential in developing thinking on integrated pollution control, noise legislation, and air quality management.

NSCA's membership is largely made up of organisations with a direct involvement in environmental protection: industry, local authorities, universities and colleges, professional institutions, environmental consultancies and regulatory agencies. Individual membership is also available to environmental specialists within industry, local authorities, central government, technical, academic and institutional bodies.

Members benefit from joining a unique network of individuals who share an interest in a realistic approach to environmental protection policy; from access to up-to-date and relevant information; from reduced fees at NSCA conferences and training events. They contribute to NSCA's regional and national activities; to environmental policy development; to translating policy into practice; to the Society's wide-ranging educational programmes.

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EDITORIAL

The UK National Air Quality Strategy A Breath of Fresh Air?

Announcing the final publication of the National Air Quality Strategy, in the *Daily Telegraph* on 12 March, the Prime Minister described the Strategy as a "breath of fresh air", the aim of which was "to ensure that the air we breathe is as pure and safe as possible". He went on to restate the crucial importance of environmental matters in not only determining the quality of all our lives, but also those of our children and children's children.

The Prime Minister quoted the National Society for Clean Air as welcoming the National Air Quality Strategy as "a milestone in air pollution control". So it is, and the Government should be congratulated for setting clear health-based standards and establishing a progressive framework for managing local air quality.

Mr. Major claimed credit for the UK being the first country in Europe to unveil such a Strategy and said that already EC legislation was following in the UK's footsteps. There is also much truth in this. The UK is clearly in the vanguard of developments on air quality management in Europe and has already largely complied with the requirements of the Directive on "Ambient Air Quality Assessment and Management". That is not to say that we do not have much to learn from some of our European partners - particularly with respect to the development of best practice for traffic management, and the provision of quality public transport, as in The Netherlands and elsewhere.

As we take stock of achievements in the UK, it should also be pointed out that the Government has yet to put in place all of the policy measures necessary to ensure the Strategy's success. There remains a significant 'policy gap' to be filled. For both nitrogen dioxide and PM_{10} , for example, the DOE's own estimates point to a gap of anything up to 10% between the reductions required to meet the objectives set out in the Strategy and those likely to be achieved as a result of measures already agreed.

One thing is clear. Whoever wins the forthcoming election will have to take urgent action to cut traffic pollution if the Strategy's objectives are to be met. The groundwork for such measures has already been laid. The Strategy, together with the accompanying draft guidance, set out clearly what must be achieved. The Government's qualified support for an admittedly watered down Road Traffic Reduction Bill also provides an important piece of the puzzle. Having received Royal Assent on the last day of Parliament, the Road Traffic Reduction Act will open the door for local authorities to develop local traffic reduction plans to complement their local air quality strategies.

Nevertheless, the Government cannot simply pass the buck for delivering clean air to local authorities, without giving them the powers or resources to do the job. We need national traffic reduction targets, a tax system which targets traffic pollution and tough new powers for local authorities.

Action is needed to link road tax to emissions for cars, and provide further tax breaks for 'cleaner fuels' such as gas and ultra-low sulphur diesel. Parking standards, the taxing of private non-residential parking and area licensing schemes all require urgent development. So does a national identification scheme for different classes of vehicles, so as to allow the selective exclusion of 'dirty' vehicles from polluted urban areas. Local authorities need powers to require bus, taxi and other fleet operators to meet enhanced emissions standards, and require large employers to introduce 'green commuter' plans. The declaration of Local Air Quality Management Areas should trigger the provision of additional funds from central government; local authorities also need a clear remit to promote community initiatives, negotiate voluntary agreements and promote other non-statutory management measures.

Taken together all of this begins to add up to quite a shopping list for a new administration whatever its political colour. However, it is no more than is necessary if we are to do justice to the laudable objectives set out in the Strategy and indeed the very purpose for which this Society was founded.

Restructuring the NSCA Preliminary Announcement of Extraordinary General Meeting

Following more than nine months' consultation in the Divisions and Committees of the Society, the Council unanimously agreed, at its meeting on 6 March 1997, proposals for restructuring the Society.

The principal purposes are to ensure that there is:

- a broadly-based democratic Council able to set clear strategic directions for the Society;
- a smaller Board of Trustees able to ensure effective and detailed oversight of the Society's affairs;
- a flexible policy development process which reflects the wide range of the Society's environmental interests and can ensure its arguments are relevant and at the forefront of public debate.

Moving the Resolution, Cllr. Jack Carr (Chairman of the Finance & Administration Committee) and George Barrett (Immediate Past Chairman of Council) said the proposals were designed to ensure the Society could continue to operate successfully in the next century. The Society would continue to be non-party political and broadly based in its membership. The changes would be carefully monitored and there would be ample opportunity to amend them if experience showed this was necessary.

An Extraordinary General Meeting to approve the proposed changes is expected to be held on Tuesday 8 July 1997. Formal notice of the EGM will be given in due course.

NSCA Divisional Meetings

Information about these events is available from Divisional Secretaries. Contact numbers are on page 58.

East Midlands

- 12 June: Divisional council meeting, Kelham Hall
- 26 June: AGM, De Montfort University, Leicester
- 10 September: Boots Chemical Company, Nottingham
- 2 October: Divisional Council meeting, Kelham Hall

Northern

- 22 April: The National Air Quality Strategy (joint meeting with Productivity North East), Newcastle

Northern Ireland

- 29 May: AGM, Castlereagh Council Office. Speakers: Paul Cooney (NSCA Chairman), Ivan Gregg (Belfast CC) on the Northern Ireland Air Pollution Monitoring Report, Nigel McMahon (Environment & Heritage Dept) on an air quality strategy for Northern Ireland

North West

- May: (date to be confirmed) Air Quality Management and Waste (joint meeting with MAPAC)

South East

- 21 May: AGM: Guy's Medical Centre, London. Speakers on Aviation & the Environment

South West

- 18 June: Zeneca Brixham Environment Laboratory, Brixham, Devon
- 25 September: Magnox Electric PLC, Berkeley Centre, Gloucestershire

Scottish

- 28 August: Managing Air Quality, University of Stirling

West Midlands

- 3 July: AGM. Speaker: Paul Cooney, Chairman of NSCA Council

NSCA NEWS & VIEWS

LOCAL AIR QUALITY MANAGEMENT

During the latter months of 1996 and the first few months of 1997, a number of consultation documents relating to the implementation of Part IV of the *Environment Act 1995* (EA) have been published. A summary of NSCA's responses to the various consultations follows; copies of the full responses are available from Sally May at NSCA.

Draft Air Quality Regulations 1997

The draft Regulations, which will be made under section 87 of the EA prescribe the air quality objectives to be achieved by local authorities by 2005 (as specified in the draft Strategy); they also prescribe the period within which county councils are required to provide district councils with proposals for inclusion in an AQ Action Plan.

NSCA's comments were largely concerned with the need for consistency of terminology and for a clearer definition of PM_{10} ; NSCA has also suggested that the schedule to the Regulations should state at which locations the air quality objectives are to apply (e.g. kerbside or urban background, etc); alternatively the schedule should make reference to where this information is to be set out in Guidance.

It was originally planned to bring these Regulations into force on 1 April 1997.

Review of LA Powers

This consultation document outlines the powers already available to local authorities to enable them to meet their obligations under Part IV of the EA and discusses whether they will need additional powers and what form these might take.

The NSCA believes that it is essential that a wide range of permissive powers are available to local authorities from which they can select the most appropriate least cost options for managing local air quality problems. Furthermore, it is important that these powers should be in place at the point at which local authorities may be required to draw up air quality action plans.

NSCA pointed out that the consultation paper focused almost exclusively on the *statutory* powers available to local authorities. For these to be used effectively, it was vital for local authorities to have sufficient resources available for inspection and enforcement. Consideration should therefore be given to ensuring that an appropriate mechanism is put in place so that the declaration of an Air Quality Management Area triggers the provision of additional funds.

NSCA outlined a number of additional priorities and recommendations for action which should be given consideration:

- LAs should be given the resources and remit to promote community initiatives, negotiate voluntary agreements and promote other non-statutory management measures;
- any new powers for LAs should be consistent with the polluter pays principle, allowing LAs to recover their costs;
- consideration should be given to establishing an identification scheme for different classes of vehicles based on their emission characteristics, to allow selective exclusions from polluted urban areas;
- LAs should be given powers to restrict road fuel sales to "authorised" fuels in certain areas;
- LAs should be given powers to require fleet operators, such as bus and taxi operators, to meet enhanced emissions standards or to use specific fuels;
- LAs should be given powers to require major employers to monitor car commuting trips and report on measures taken to reduce these.

LA Circular on AQ and Land Use Planning

The principal objectives of this Circular are to ensure that the land use planning system contributes to the achievement of national AQ objectives and standards and that AQ is considered along with other material land use matters. It reminds local planning authorities of the need to have regard to the National Air Quality Strategy and to LA reviews and assessments of air quality.

Again NSCA's comments were largely concerned with seeking clarification on various aspects of the Circular. In addition, NSCA also suggested that the Circular should be drawn to the attention of the economic development and chief executive functions within local authorities; the large capital programmes, for which these functions often have responsibility, have the capacity either to drive a coach and horses through the best laid air quality plans and strategies, or to give real force to them.

While understanding the intention behind keeping local air quality reviews and assessments separate from the development plan process, NSCA considers it important that they take account of each other. This could be achieved, NSCA suggests, by ensuring that the findings of LA reviews and assessments and the designation of LA AQM areas is taken into account as far as the Strategy and

land use proposals in Structure, Unitary and Local Plans are concerned. This information should be available at the deposit stage of the development plan and the Inspector should have regard to this information in forming a view of the development plan.

NSCA also believes that environmental statements are an essential element in major planning applications and that the air quality elements of such statements must be prepared by competent professionals with relevant experience.

The recognition in the Circular of the importance of the link between parking standards and air quality was to be welcomed. It was however essential to give priority to developing Guidance to help LAs determine parking standards. In this context, land use planners should be encouraged to consider removing car parking spaces in locations with poor AQ records.

With regard to planning and pollution control, NSCA notes that the introduction of environmental assessment has meant that the planning system has to consider the air pollution impacts of major proposals. Planning authorities must be concerned with ambient air quality and the need to avoid any adverse cumulative impacts of proposals. The Environment Agency on the other hand is concerned with ensuring that a proposal for authorisation adopts the best possible technology and that the emissions from the stack are minimised. There is not therefore a conflict between the objectives of the two authorities. It is however difficult for local authorities to understand and interpret the technical information included in an environmental statement correctly without the proper input from the Environment Agency. It has been suggested that this problem could be overcome if the planning application and IPC authorisation were submitted and evaluated at the same time. At present developers argue that it would be too expensive to do this but recent long drawn out planning inquiries for

incinerators would suggest that this is a false economy and particularly wasteful of local authority time. The NSCA therefore recommends that the procedures for applying for IPC authorisation and planning consent be reviewed.

LA Circular on AQ and Traffic Management

This draft Circular provides advice and guidance to local authorities for extending and refining traffic management plans so that they contribute to action plans for dealing with local AQ problems.

In generally welcoming the draft circular as a useful starting point, NSCA said that it provided an extensive list of the types of possible traffic management measures available to local authorities but little guidance as to which measures should actually be used or indeed how effective the different measures might be.

There was clearly a need for local authorities to be provided with more information about which measures, or combination of measures, are most cost effective and what level of improvement in air quality they might deliver. A summary table of the various options incorporating a rating system of some kind would be particularly helpful. The Circular should also provide examples of best practice in this area, or at least references to where such examples may be located.

Other points needing development or consideration included:

- greater emphasis on parking policies and controls as a tool for AQ management;
- experimental trials of high occupancy vehicle lanes;
- new local authority traffic management powers for AQ;

AQ INFORMATION SYSTEM

The Government finally published its proposals for revising the system of air quality bandings (see table) which have

Table: Proposed Air Quality Bandings

Description "... air quality"	"Standard Threshold"		"Information Threshold"		"Alert Threshold"	
	very good	generally satisfactory/moderate	poor		very poor	
Sulphur Dioxide	100ppb/15 minute		200ppb/15 minute		400ppb/15 minute	
Ozone	50ppb/8 hour running		90ppb/hour		180ppb/hour	
Carbon Monoxide	10ppm/8 hour running		15ppm/8 hour running		20ppm/8 hour running	
Nitrogen Dioxide	150ppb/hourly		300ppb/hourly		400ppb/hourly	
Fine Particles (PM10)	50µgm'/24 hour running		75µgm'/24 hour running		100µgm'/24 hour running	
Effects	Harmful effects unlikely to occur, even in sensitive groups.	There could be a small risk of effects in sensitive individuals and/or disamenity may begin to occur.	Some adverse effects in sensitive groups may occur and disamenity would increasingly be experienced.		Risk of more serious adverse health effects, not necessarily confined to sensitive groups. Serious disamenity may occur.	
Action			Provision of relevant advice to those who may be affected.		Provision of advice more generally. Additional action may be necessary.	

been used to give information to the public on air quality since 1990. The proposals are intended to take into account the standards and objectives for air quality in the National Air Quality Strategy.

In an initial response NSCA said that the proposals would continue to mislead the public. In particular, NSCA said that it was unacceptable to use the term “very good” air quality in relation to particles, a pollutant for which there is no known safe level; it also could not be right to use the terms “generally acceptable” or “moderate” air quality in areas where local authorities may be required to declare local air quality management areas to protect the health of the population. Any air quality information system must support the objectives set out in the draft National Air Quality Strategy and the minimum health based standards upon which the Strategy is based.

NSCA’s detailed comments on the proposals will be included in the next issue of *Clean Air*.

ENVIRONMENT AND HEALTH

As reported in the last issue of *Clean Air* (March/April 1997, page 49), the Government is proposing to include the environment as a key area in the Health of the Nation Strategy.

In welcoming the proposal NSCA said that it presented a significant opportunity to realise a wide range of benefits for environmental health, whilst complementing existing policies on health promotion, environmental protection and sustainable development. It was important, however, that the initiative was integrated with other key areas and linked with other strategies, particularly the Local Agenda 21 process, in a more effective and dynamic manner.

The proposal would however need considerable further development if it was to be successful in the longer-term. At present coverage of the various policy areas was very uneven and there appeared to be little coherence in the document’s breadth of vision and little by way of objective priority setting. There was also no indication of new resources.

NSCA had a number of comments on the specific proposals for each of the target areas:

- **Outdoor air quality:** of the five target areas, this is clearly the most developed in policy terms, taking its detailed targets from the National Air Quality Strategy; the targets should however be extended to include indicators for traffic reduction.
- **Air quality in the home:** this section should also cover indoor air quality, including that in the workplace. There is considerable need for further training to be provided for professionals working in this area. Specific advice is also required on how to reconcile improvements in energy efficiency and insulation with the adverse effects such measures are likely to have on

indoor air quality. The targets for indoor air pollution should also include the issue of environmental tobacco smoke.

- **Radon:** targets should be tightened up and resources made available for mandatory radon proofing grants for all affected properties, irrespective of the occupant’s means. A Housing Fitness Standard should be set for radon. Occupational exposure in the workplace should also be considered and the issue of radon in water supplies, including those drawn from private sources, should be dealt with.
- **Noise pollution:** targets relating to the percentage of homes complying with Building Regulations on sound insulation, and provision of and satisfaction with mediation services should be considered. Sources of environmental noise, such as traffic noise, should also be dealt with and targets relating to the reduction of environmental noise given.
- **Lead in drinking water:** the target should be water quality generally, both drinking water and the quality of recreational waters, such as boating lakes and bathing waters.

NSCA considers that the development of health alliances has an important contribution to make to improvements in environmental health. However, central government has a considerable responsibility to ensure that such initiatives are properly resourced and founded on solid information and research. Central government should also provide guidance to ensure that such alliances complement existing policy initiatives and identify examples of best practice from which others can learn. However, health alliances should not be considered as a means of advancing policy “on the cheap” - resources should be made available at both a national and local level to ensure the success of such initiatives.

REPORTS

The Role and Assessment of Best Practicable Environmental Option (BPEO) within the National Waste Strategy

On 26 November 1996, NSCA held a seminar entitled "Making Waste Work for You - developing BPEO for Waste Disposal". Held in association with the Institute of Wastes Management and the Environmental Services Association, the seminar aimed to help all those concerned - waste operators, regulators and local authorities - with agreement of BPEO to address the issues in an informed manner, and to identify means by which public consensus on the acceptability of waste management options can be achieved at local level.

NSCA asked waste consultant, Maggie Thurgood, to attend the seminar and to prepare this paper which draws together some of the issues to be taken into account.

A National Strategy

In December 1995, the British Government published its White Paper *Making Waste Work*, in which it outlined a national strategy for waste, something which many had been demanding for a long time.

Subtitled "A strategy for sustainable waste management in England and Wales", the paper identifies three key objectives:

- to reduce the amount of waste which we produce;
- to make the best use of that waste which is produced; and
- to choose waste management practices which minimise the risks of immediate and future environmental pollution and harm to human health.

Within a hierarchy which ranks waste management options in order of preference, reduction and re-use come first and second.

The various recovery options of materials recycling, composting and energy recovery are linked at the next level of importance. This is slightly at variance with earlier versions of the hierarchy, where materials recovery was rated to be of higher relative importance than energy recovery.

The majority of waste professionals would support the revised form, believing that recycling's potential contribution, while significant and worthwhile, is sometimes overstated in terms of both volumes which can be recycled and the environmental benefits of so doing. Distorting the potential for any one option can result in other, equally valid, options being undervalued.

In recognition of this, and in support of the waste strategy's ranking of the three recovery options together,

Stuart Hoggan of the Department of the Environment in his presentation to the NSCA seminar on BPEO held in Birmingham, stated that:

"There are practical and economic limits to the potential for composting and recycling but there is scope for all three recovery options to be developed side by side, and value in integrating the recovery solutions."

Finally, and lowest on the hierarchy's ranking comes disposal, which is nevertheless acknowledged as necessary and inevitable for some wastes.

The strategy aims to provide a framework for planning and action. It considers in detail ways of increasing the use of the options at the top of the hierarchy for greater proportions of our waste, as well as making proposals for improving the sustainability of all of the options.

The hierarchy must, however, be seen as general guidance only, rather than be strictly adhered to in its order of priority, as this may result in the selection of unsuitable and environmentally unsound waste management options. The hierarchy is just one of the check lists which waste managers must use in pursuit of optimising their approach.

Further, it is unlikely that any city or region will resolve their waste management needs with any single option. Many waste specialists are now recommending the need for an integrated approach to waste management with a mix of treatment and disposal options tailored to local circumstances. The need therefore is to obtain the optimal mix of avoidance, re-use, recovery and disposal.

Decision Making Tools

A sustainable and integrated approach to waste management which employs an optimal mix of reduction, re-use and recovery options in addition to treatment and

disposal is not easily achieved. Every region's circumstances, and waste streams, are different. In order to aid the decision makers in their task, a number of mathematical models and tools have been devised. Some, like the hierarchy, allow a "coarse" first sort of options, and may enable managers to quickly discount certain approaches which, in a particular set of circumstances, are clearly inappropriate. For example, it would not be appropriate to try to recycle clinical wastes, or practicable to compost wastes with low organic content.

Identifying the Best Practicable Environmental Option (BPEO) for any waste stream involves an assessment of both economic and environmental costs of any waste option. It is not a simple or straightforward process, but while the hierarchy should be used as a general guide to priorities, there may be many instances where direct disposal of waste to landfill, despite being lowest on the hierarchy's ladder, provides the Best Practicable Environmental Option for that waste. The White Paper, *Making Waste Work*, concedes that, and goes on to set targets for waste recovery and a reduction of waste to landfill, stating that such targets must be addressed only in terms of BPEO.

The BPEO Concept

The concept of BPEO was first proposed by the Royal Commission for Environmental Pollution in the 1970s, and resulted from the Commission's conclusion that pollution control mechanisms which were based on the impacts of emissions to a single environmental medium were not sufficient. It proposed that a broader approach which looked at all environmental media was necessary to achieve the best practicable environmental option. The Royal Commission later defined BPEO as:

"The outcome of a systematic consultative and decision-making procedure which emphasises the protection and conservation of the environment across land, air and water."

The use of BPEO was made formal in the *Environmental Protection Act 1990*, as part of the Integrated Pollution Control requirements. In that same Act, prescribed industrial processes were further required to use the best available techniques not entailing excessive cost (BATNEEC) to prevent, minimise or render harmless any releases. Since that time, guidance on assessing BPEO as part of Integrated Pollution Control has been published and methodologies proposed, setting environmental impacts against economic costs. While this early approach was targeted at specific industrial processes, the concept of applying BPEO has now been broadened to apply to waste management in general.

A major part of the decision making process for BPEO assessment involves a process similar to the one used in the calculation of Life Cycle Assessment (LCA), another tool

aimed at taking account of the whole range of environmental impacts. There are considerable overlaps between BPEO and LCA techniques, and LCA can be used to help determine BPEO.

Life Cycle Assessment

Life cycle assessment (LCA) involves the evaluation of the environmental burdens of a product or process by means of detailed inventories of energy and materials used and waste and emissions released. While not an entirely new science, the use of LCAs in the detail currently employed is recent, and has most often been applied to specific products (such as drinks containers, detergents or disposable nappies) rather than for processes like waste management.

LCA is a multi-stage process, with the scoping and inventory stages followed by impact assessment and, in the case of some LCAs, a final improvement assessment. The first stage, of setting the boundaries for the LCA, has been a contentious one. Take for example an LCA on a paper carrier bag. Do you set the "cradle" or first boundaries at the paper mill, where the pulp is delivered, and examine the energy and water consumption, and environmental impacts from that point onwards, through paper manufacture, delivery to bag manufacturer, printing and selling? Do you also include the cutting, felling and transporting of the trees to the pulp mill, or do you go further back still and include the fertilisers and energy used to grow the trees in the first place? And what about the mining of the metal ores to make the mechanical equipment with which you managed and harvested the wood?

The same boundary-setting questions arise for the other end of the process, the "grave". Does the sale of your manufactured paper carrier bag constitute the end of the LCA process, or should you evaluate its impacts in use and disposal? How can you compare its recycling for example, when you cannot judge the distance it may have to travel to a recycling point, nor evaluate the environmental impacts of the technology used by the recycling industry.

Inevitably in starting on an LCA, some assumptions must be made, and boundaries set. The second, inventory, stage involves the gathering of statistical information about the type and quantity of raw materials and energy consumed, and the emissions to all environmental media.

Following that second, data gathering, step, the impact assessment must be calculated. This involves the weighting of impacts, based on a subjective ranking of environmental effects. For example, one means of calculating the impacts of emissions of carbon dioxide, as a contributor to global warming, may be evaluated by calculating the emission as a percentage of the total emissions and "scoring" it accordingly. Emissions of CFCs and HCFCs, which contribute to ozone layer depletion, could be similarly ranked. Emissions of materials such as ammonia, which contribute to eutrophication, would be separately ranked.

There are other conventions, most of which depend on grouping of emissions.

Sometimes an overall index figure is arrived at, although some LCA practitioners are unhappy with single score results from LCA studies.

Terminology

In common with many sectors, waste management has its own jargon, acronyms and specialist terms. The following are brief descriptions of some of those terms which are associated with issues addressed in this paper.

BATNEEC - Best Available Techniques Not Entailing Excessive Cost - *A process which informs BPEO.*

BPEO - Best Practicable and Environmental Option - *A means of evaluating environmental and economic factors.*

IEI - Integrated Environmental Index - *A scoring method for environmental factors similar to LCA but which does not weight impacts.*

IPC - Integrated Pollution Control - *Introduced in the Environmental Protection Act 1990 to consider emissions to air, land and water as a whole and not in isolation.*

ISWM - Integrated Solid Waste Management, or sometimes, Integrated Waste Management (**IWM**) - *A waste management approach which aims to optimise the mix of treatment and disposal options.*

LCA - Life Cycle Assessment; formerly Life Cycle Analysis - *A detailed method of arriving at statistical "scores" for a product or process in terms of its environmental impact, and energy and raw material consumption.*

LCI - Life Cycle Inventory - *The data collection stage of LCA.*

LCM - Life Cycle Management - *A broader approach based on the principles of LCA but without the detailed inventory stage of data collection.*

Proximity Principle - *A ruling which requires wastes to be disposed of as near as possible to their point of generation.*

Sustainability - *Meeting the needs of the present without compromising the ability of future generations to meet their own needs.*

process using process-specific and site-specific data. Consequently the system boundaries for BPEO may be narrower than those for an LCA.

Some of those involved in establishing BPEO methodologies have expressed concern about the narrowness of this approach, and want to see system boundaries widened to include resource consumption and directly related processes associated with the prescribed process, which are currently excluded from BPEO assessment.

The stages for a BPEO process are similar to those for LCA. The first stage identifies the objectives, and sets the boundaries for the prescribed process. Then a list of options is created, with reference to techniques and costs (BATNEEC). Instead of the second inventory stage of LCA, the BPEO procedure undertakes an analysis of releases to air, land and water of the process. Assessing those results and estimating costs enables the identification of BPEO.

The main difference between BPEO and LCA is that BPEO assessment is only conducted on prescribed processes. The broader scope of the LCA brings with it the difficulty of boundary setting, which becomes subjective, but providing it is transparent it need not be a limiting factor.

Technologies

While BPEO cannot be determined for a single technology in isolation, in many cases the selection of BPEO for waste management requires the comparison of different technologies.

An evaluation of the local situation to frame and inform the choice is the necessary first step. Detailed examination of the inputs, upstream and downstream waste management practices, and the scope for any recovery options, will need to be undertaken. Then criteria can be set for the different technologies to meet. In this way, the regulatory aspects, and the strengths and weaknesses of the different options, can be listed. While this alone will not arrive at BPEO, it will help to inform the debate.

BPEO cannot be based on a single facility or a single technology. Despite that, detailed technical data covering the different technologies, and the processes involved, can help in the determining of BPEO, while still taking note of any site-specific factors.

Essentially there are only a few ways to deal with waste. Refinements on those basic processes are being devised all the time however. The way in which we landfill waste has undergone several complete reversals in the past fifty years, and another is under consideration currently with the proposal to use landfill sites as "flushing bioreactors". These would accelerate the rate at which wastes decay within the landfill, and thus speed up the

BPEO

The BPEO assessment under Integrated Pollution Control (IPC) measures the environmental impact for an individual

attainment of a stage by which the site can be considered stable, and unlikely to cause further harm. This has become important in view of the requirements for landfill operators to continue to be held responsible for completed sites until those sites can be shown to have no further potential to cause environmental damage. In the case of traditional landfilling techniques, which exclude air and water, this could take 100 years or more. However, the flushing bioreactor landfill has not yet been proven and more research must be undertaken.

New air pollution control systems, and a strict regulatory regime which has resulted in the closure of many incinerators, have considerably reduced the adverse environmental impacts of waste incineration. Composting and anaerobic digestion techniques have had an increasingly high profile in the past two years, and developments in feedstock selection and management, odour control, and product quality standards are taking the debate forward quickly.

It is these and similar developments in technologies which are raising the standards and moving us towards sustainable waste management policies. The charts (Tables 1 and 2) demonstrate some of the criteria for establishing BPEO with reference to three specific commonly used technologies.

Players

National legislation on waste and on environmental impacts is driven by Directives from the European Union for the most part. The implementation and interpretation of those Directives for England and Wales involves a number of players.

Waste management planning and decision making involves all of the groups below, and all have an important role to play and a contribution to make:

- National government
- Regional/local government
- Environment Agency
- Private sector waste industry
- Public.

However, these roles must dovetail in order that decisions are not side-stepped, delayed or postponed, something which has been a feature of contentious waste planning issues in the past. A consistent approach is also important, and again has been absent in the past. Partnerships between two or more players are increasingly a feature of successful waste planning and implementation.

Within the framework of the national policy, it seems clear that the lead role in informing, liaising, guiding and enforcing must be that of the Environment Agency.

It can provide the consistent approach which is needed nationally, can support local government with technical and scientific research and information, and can aid in the drive

for a better-informed public. At the same time the Agency must enforce and monitor the regulatory regime, working closely with industry. Finally it must report back to national government on policy.

It is a pivotal role.

The Environment Agency

The Environment Agency was set up under the *Environment Act 1995* and came into force in April 1996, merging HM Inspectorate of Pollution, the National Rivers Authority, waste regulation authorities and some parts of the DOE. Its aim is to “*protect and enhance the environment*”.

The formation of the Agency has not been universally supported, although even its critics applaud the aim of a nationally consistent and unified approach.

An effective R&D programme is one of the tools planned by the Agency, and in addition to a new programme of work on the use of LCA and Life Cycle Inventory (LCI) in waste, it also inherited a number of R&D projects on waste.

A £1 million ongoing research process on LCA, divided into five phases, is being managed by Terry Coleman of the DOE's Waste Technical Division.

During 1996 separate investigations examined the LCI for transporting, collecting, and separating waste as well as that for incineration, landfilling, composting and anaerobic digestion and recycling. A further research project to develop data quality guidelines in order to promote a consistent and transparent approach for LCI assessments was also undertaken. Phases 3 (1996/97) and 4 (1997/98) of the EA's R&D programme for waste will look at Life Cycle Analysis and impact assessment damage cost evaluation, while the separate IPC R&D programme includes a number of BPEO studies for different industry sectors. For the years ahead a number of BPEO Good Practice Guides are planned. So are sustainability indicators for local environmental management plans, and public perception issues.

In addition to R&D programmes, the Agency has recently published a consultation document, *Our Strategy for the Environment*, and plans to shortly be issuing individual strategy documents from this. Failure to participate in such a consultation is itself wasteful: if the newly-formed Agency is to fairly represent the interests of all sectors, it needs dialogue.

There are, and will probably continue to be, criticisms of the Agency, its administrative structure, the perceived bias towards water issues, and its lack of practical expertise in the waste arena. The only way to address those criticisms, and to mould the Agency into the unified body urgently needed, is to work with it, contributing to the debate.

The Other Players

While the Environment Agency may have the pivotal role for taking waste management forward, the other players in that future must make their own vital contributions.

National Government must on the one hand ensure that the Agency, charged with enforcing its policies, properly fulfils its role. On the other hand it must provide the Agency with sufficient resources to do so.

Local government continues to have responsibility for waste planning and for implementing waste management strategies. It should lean heavily on the services the Agency can provide, and work with EA officers to aid in its own decision-making process. A good relationship between local authorities and the EA is a vital component of sustainable waste management planning. Both sides need to work on this relationship, which is perhaps the most sensitive relationship the Agency has to forge as it becomes established.

The private sector waste industry also needs to establish dialogue with the Agency, and with those local authorities with whom it is negotiating or for whom it already works.

As yet the role of the public in waste management has not been formalised or its power positively exploited. There is a noticeable and encouraging trend towards more openness and public consultation in recent years. That trend needs to continue and expand. Local government, and the Agency, both have contributions to make to this. A number of UK local authorities have undertaken very extensive, and well-publicised public consultation processes, one of which is Hampshire County Council. Work to identify the optimum means of communicating the complex waste message to members of the public has been undertaken by universities and consultancies. It seems clear that starting to communicate the message when local opposition to a proposal has already hardened is too late.

The other side of the coin is the difficulty of getting people interested in the abstract issues of waste management when their homes and districts are not directly involved and they perceive no "threat".

Having established the players in the process, the determination of the Best Practicable Environmental Option for managing waste will still be a complex process.

The Future

The process of evaluating BPEO for any region, facility or waste stream offers an ideal opportunity for dialogue between private and public sector, and between waste professionals and the public they serve. Municipalities which need to implement waste strategies and to work towards the Government's aim of moving more waste handling up the hierarchy of options need to work closely with the waste management industry.

The waste industry can smooth its own path as well as that of the municipality by working with the Agency and local government, by providing detailed information about technologies it may employ, and by transparency in their dealings.

BPEO does not depend on public acceptance but the pursuit of BPEO can provide an invaluable opportunity for information exchange. When the public is involved in the lengthy and complex process of evaluating the social, economic and environmental considerations of handling, treating and disposing of their waste, they may more readily participate in the chosen options, even where those options were not their first choice.

The criteria for attaining BPEO must include sustainability considerations, the waste hierarchy and any national or EU targets.

Self-sufficiency and proximity must be considered, as must any current or anticipated legal or economic instruments.

Finally the financial and contractual position must be assessed.

- BPEO brings a scientific approach to bear on what may otherwise be an emotional decision.
- It informs and modifies the hierarchy approach according to local circumstances.
- Most importantly, however, it must be recognised that BPEO is only a part of the decision-making process and is not a technology attribute.

The real challenge for all parties is to translate the concept of BPEO into practice. To achieve that will require concerted effort.

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Table 1: BPEO for Incineration, Anaerobic Digestion (AD) and Composting of Waste

	Incineration	AD	Composting	
			High Tech	Low Tech
Typical scale	Large 150,000-600,000 tpa	Medium 35,000-60,000 tpa	Medium 40,000+ tpa	Small/medium 2,000-50,000 tpa
Capital costs	High £50m-£100m	High £10m-£30m	Medium £3m-£3.5m	Low £50,000-£0.5m
Gate fee	£20-£40 per tonne	£25-£35 per tonne	£15-£25 per t.	£10-£20 per tonne
Residues (% weight)	25%	10%	5%	5%
Time horizon for planning	Long (+3-5 years)	Long (+3 years)	Med/long (+2 years)	Short/Med (+1 year)
Contractual obligations	20 years +	20 years +	20 years +	5 years +
Technical confidence	High	Low/medium	Medium	High
Impact on collection	None	Non/partial	Partial/none	Partial
Public acceptance	Very low	?	Fair/good	Good
Public commitment	None	Low/medium	Medium/low	High
Regulatory changes: process	Incremental Predictable	Incremental Predictable	Incremental	High risk for mixed waste
Regulatory changes: product	Low risk	Medium risk	Med/high risk	High risk for mixed waste

Table 2: BPEO Criteria - Environmental Targets

	Incineration	AD	Composting	
			High Tech	Low Tech
40% value recovery	Full	Full/partial	Partial/full	Partial
25% recycling	Low	Low/full	Med/full	Low/medium
Compatible with materials recycling	Partial	Partial	Partial/full	Full
Proximity/self sufficiency	Large conurbations	Large towns	Large towns dense rural	Small towns villages
Impact on landfilling	Very high	Med/high	Medium	Low
Impact on waste transport	Potentially very good	Good/fair	Good/fair	Fair/poor
Major avoided activity benefits	Coal combustion landfill/transport	Coal combustion Peat extraction Chemical nutrient use	Peat extraction Chemical nutrient use	
Sustainable	?	Yes	Yes	Yes
Noise	Low	Low	Low/medium	Med/high
Odour/dust	Very low	Low/medium	Low/medium	Med/high
Visual	High	Medium	Medium	Low/medium
Landtake	Medium/low	Medium	Med/high	High
Traffic disamenity	Medium/high	Medium	Medium	Medium/low

Source: Barton, JR, 1996

Determination of PM₁₀ by Partisol, TEOM, ACCU and Cascade Impactor Instruments in the London Borough of Greenwich

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A comparison between four different methods of measuring PM₁₀ has been carried out using a nine fraction Cascade Impactor and the TEOM with ACCU systems.

Despite very good correlations between methods, there are appreciable quantitative differences. The TEOM gave lower results by comparison with the reference method especially under episode conditions. This is ascribed to the standardised higher temperature sampling by the TEOM which leads to loss of volatiles. The more recent design of the ACCU gave results at 78% of those from the Partisol system. The Impactor oversampled at low levels and undersampled at high levels relative to the Partisol. The quartz filters accumulated an "invisible mass" which is thought to be from volatile organic compounds. There is also mass loss of particulates from the Impactor filters to side walls.

These differences appear to have implications for both monitoring and regulating authorities, and it is recommended that the PM₁₀ air quality standard should be set by reference to a prescribed method.

Introduction

Previous work with different methods for measuring PM₁₀ (particulate matter in air less than 10 micrometres diameter) at the Greenwich Environmental Curriculum Centre, which is part of the London Air Quality Network, had shown unexplained discrepancies⁽¹⁾. The present comparison quantifies these differences, using four types of equipment located within a few metres of each other.

- (i) The **Partisol** Model 2000 Air Sampler, manufactured by Rupprecht and Patashnick. This US EPA reference method draws air (16.7 l/min) through a PM₁₀ head and then through a standard 47 mm diameter filter.
- (ii) The Tapered Element Oscillating Microbalance, **TEOM**, (also by R & P, and a US EPA equivalent method), can provide PM₁₀ results every 15 minutes. It uses the same PM₁₀ head and air flow as the Partisol, but only 3 l/min passes through the microbalance. The remaining 13.7 l/min passes to atmosphere, or through the ACCU.
- (iii) The Automatic Cartridge Collection Unit, **ACCU**, is controlled by the same electronics as the TEOM, and is an optional PM₁₀ sampler on a standard 47 mm filter.
- (iv) The **Cascade Impactor** (Graseby-Andersen) is a multistage device for measuring particle size distributions. Air at 28.3 l/min is drawn through a PM₁₀ preseparator, and successively smaller particles impact onto eight collection filters. There is a final back-up filter which collects submicron particles, and this is the only filter of the nine to have air passing through it.

Sampling Programme

The South East Institute of Public Health (SEIPH) operated the TEOM, which gave data for consecutive 15 minute periods. This was summed to give PM₁₀ data for the same six or seven day operating times as the other instruments. The comparative nine month study started in November 1995, and average weekly temperatures ranged from 1.1°-21.1°C, and weekly PM₁₀ values (Partisol) from 10.4 to over 100 µg/m³.

Procedure

The Partisol and the ACCU use 47 mm filters and most runs were carried out using Pallflex TX40. Quartz filters were used in all stages of the Cascade Impactor.

Immediately prior to initial and final weighing, all filters were equilibrated to laboratory conditions by placing them under plastic dust covers which allowed free air flow. The mass of particulates was determined by weighing the appropriate filters before and after the test period. Three weighings were recorded to 0.01 mg for each determination.

The Impactor filters were washed and dried prior to equilibration. Since the weight of quartz filters changes with temperature and humidity, a set of nine filters were retained in the plastic enclosures during the test periods and these served as humidity controls. The exposed filters with their particulate mass were corrected for changes in humidity by multiplying the initial weight of each filter by the ratio of the initial and final weights of the control filters.

Results

All the results of the instruments were reported at US Environment Protection Agency standard conditions of 25°C and one atmosphere pressure.

A paper giving more details of our results is available from the first author.

Partisol/ACCU

The data for the ACCU are separated into two groups, according to the configuration of the side arm and connecting tube which routes 13.7 l/minute of air from the TEOM to the ACCU system. Before 25 March 1996 (ACCU 1) the side arm was set at a right-angle with a connecting tube 5.3m in length. The second group after 3 May 1996 was after the side arm angle had been changed to 45° and the tube shortened to 0.75m, (ACCU 2).

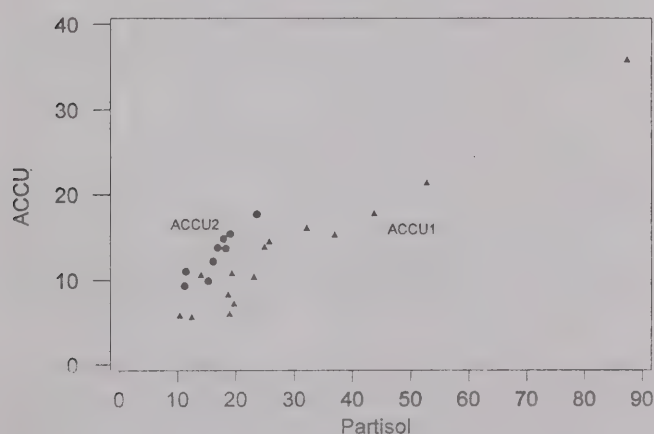
Figure 1 gives a plot of the Partisol and ACCU data. The linear regression equations for ACCU 1 and ACCU 2 were as follows.

$$\text{Partisol} = -3.22 + 2.47 \times \text{ACCU 1} \\ (R = 0.971, n=15, p<0.001) [1]$$

$$\text{Partisol} = -0.19 + 1.28 \times \text{ACCU 2} \\ (R = 0.919, n=9, p<0.001) [2]$$

With the earlier right-angled side arm it can be seen that the mass collected on the ACCU 1 filter was less than half that of the Partisol. The later changes (ACCU 2) which gave less deviation and a shorter path to the air flow produced results which were 78% of those of the reference Partisol system.

Figure 1: PM₁₀ Data Ex Partisol and ACCU, Old Arm (1) and New (2)



One non-standard run was carried out under ACCU 1 conditions, where the standard filter holder was replaced by the Cascade Impactor. It was found that the first three stages did not have any characteristic patterning due to particle impaction (though there was invisible mass increase, discussed later), and in the fourth stage it was much reduced. This indicates attenuation of larger particles down to at least 5µ under the ACCU 1 configuration. R &

P state that whilst the 2.5 and 1µ heads are suitable for gravimetric work, with the 10µ head the ACCU is designed for chemical speciation purposes only.

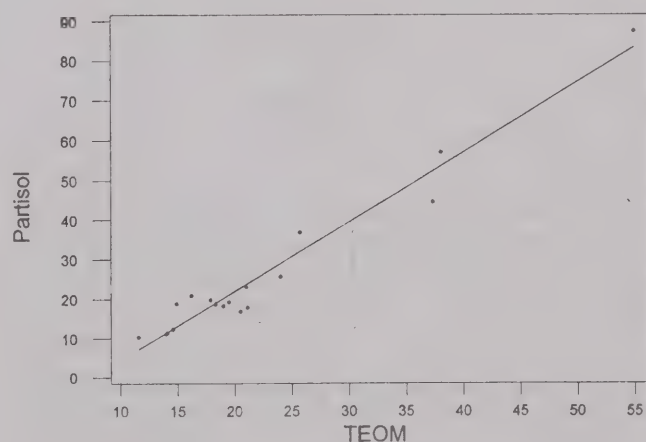
Partisol/TEOM

The relationship between Partisol and TEOM instruments is shown in Figure 2. Using only the measurements on TX40 filters and excluding one outlier, the linear regression equation is:

$$\text{Partisol} = -13.15 + 1.758 \text{ TEOM} \\ (R = 0.978, n=18, p<0.001) [3]$$

Equation [3] shows an intercept which could mean that at low concentrations some particles are detected by the TEOM but not by the Partisol, and up to about 17 µg/m³ the TEOM gives readings slightly higher than the Partisol. However above this value the Partisol exceeds the TEOM results, such that for Partisol readings of 50 and 100 µg/m³ the TEOM values are 36 and 64 respectively. It is thought that this discrepancy is primarily a function of the different sampling regimes, as the TEOM measures particle mass at a constant 50°C whereas the Partisol samples under ambient conditions.

Figure 2: Partisol PM₁₀ Data mmg/m³ Plotted Against TEOM



It appears that there is good agreement between the TEOM and gravimetric methods where involatile particles have been used to standardise the microbalance^{(3), (4)}. However, attempts by automotive engineers to use the TEOM to measure diesel particulates from engine exhausts have also encountered the problem of low results attributable to high sampling temperature^{(4), (5)}.

The principle of a 24 hour running mean is also embodied in the UK national air particulate standard of 50 µg/m³⁽⁶⁾. If this is to be monitored with one instrument, then the TEOM is one of very few instruments able to provide data which can be summed over any consecutive period of 24 hours, and it is for this reason that it has been chosen by the Department of the Environment's Automatic Urban Network sites in the UK⁽⁷⁾. However, both regulating and monitoring authorities need to be aware that the TEOM

does give lower results than the Partisol (a US EPA standard method when used over a 24 hour period). The air quality standard should specify the test method to be used to monitor compliance with it. There is concern that data used by EPAQS⁽⁶⁾ to set the current limit of $50 \mu\text{g}/\text{m}^3$ may have come from older gravimetric methods.

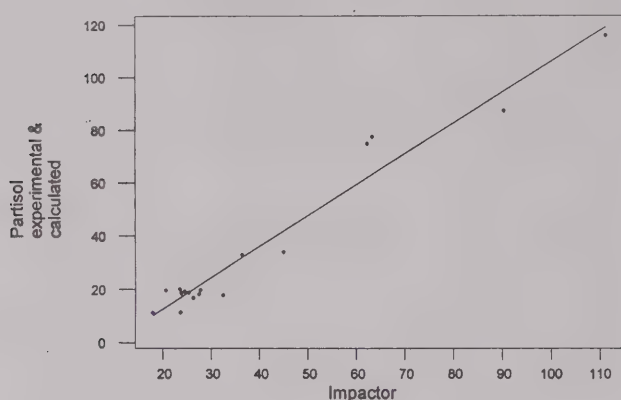
Partisol/Impactor

Figure 3 is a graph of total concentrations of particulates collected by the Impactor (i.e. sum of all stages) against the respective Partisol measurements. The linear regression equation between them was found to be:

$$\text{Partisol} = -10.6 + 1.17 \text{ Impactor}$$

$$(R = .978, n=17, p<0.001) [4]$$

Figure 3: PM₁₀ Data from Partisol (exp & calc) v Impactor (All Stages)



It is apparent from Figure 3 that there is a substantial intercept on the Impactor axis, indicating mass on the Impactor at low particulate levels which was not found on the Partisol. Equation [4] shows that at PM₁₀ concentrations above 62 on the Partisol, the Impactor PM₁₀ results change from being greater than, to less than, values on the Partisol. The large mass of nine quartz filters in the Impactor may be adsorbing some species from the air which increases their weight. Although quartz fibre filters are said not to adsorb SO₂ and NO_x⁽²⁾, they still adsorb organic gases strongly⁽⁸⁾. A number of experimental runs were undertaken in which filters were placed *before* the impaction stages, and invisible but weighable mass was still detected on the quartz impaction filters. Evidence from the literature suggests that volatile organic compounds are the most likely cause. It is also known that some particulate mass sticks to the internal surface of the Impactor⁽⁹⁾, and the evidence for this comes from a need to clean the instrument, and the regression coefficient greater than unity in equation [4].

Examination of the mass on each of the individual stages of the Impactor shows that at high total concentrations and especially above $50 \mu\text{g}/\text{m}^3$, most of the mass increase is due to particles in the $0.65\text{--}2.1 \mu\text{m}$ size range (stages 4, 5 and 6).

Conclusions

1. Using the Partisol as a reference, excellent linear relationships have been established with the other three types of sampling equipment.
2. The differences found between the Partisol and TEOM highlight the different sampling conditions of the two instruments. The TEOM takes measurements at a constant 50°C to negate the effect of filter artefacts. However at this temperature certain volatile species will not be detected, but the amounts on the Partisol will be a function of the ambient conditions during the period that the filter is *in situ*.
3. Thus the TEOM appears to give lower results than the Partisol under episode conditions, and others have shown that this may be due, in part, to under estimation of diesel particulates. It is suggested that regulating authorities should recommend a specific reference method, with tightly controlled sampling conditions, when setting air quality standards.
4. The Impactor when used with quartz fibre filters gives anomalously high mass readings at low PM₁₀ concentrations, and from the literature these appear likely to be volatile organic compounds. Under episode conditions mass loss by adherence to the internal walls of the instrument appears to occur, especially for particles below $2.1 \mu\text{m}$ aerodynamic diameter.
5. The by-pass flow to the ACCU is sensitive to side-arm angle and to the length of the tube carrying air to the sampling cartridges. The ACCU appears to be attenuating at the large particle end of the size distribution.

Acknowledgements

- Mr. Peter Carne, Manager, Greenwich Environment Curriculum Centre.
- ETI for the loan of the Partisol equipment.

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Environmental Dust Monitoring Using Computer Scanned Images Obtained From Sticky Pad Poly-directional Dust Gauges

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The use of sticky pad gauges for the monitoring of 'nuisance' dust was first established in the early 1980s and has since become a widely accepted method both by local authorities and industry. Although primitive, the method has a number of advantages, amongst which are its low cost and simplicity. Dust levels are established in terms of Effective Area Coverage based on samples of reflectance measured with an analogue reflectometer.

Recent advances have led to the development of directional sticky gauges giving additional information on possible dust sources. This paper describes the use of an alternative method of sticky gauge analysis based on computer scanned images.

Introduction

As part of a recent study by Arup Environmental (on behalf of the Department of the Environment - Minerals Division), people living close to a number of surface mineral operations were questioned about nuisance from the workings. The environmental impact mentioned most in this study was dust. It was noted in the study report that this dust caused a nuisance rather than health effect.

The DOE report also reviewed techniques and equipment available for the monitoring of dust nuisance. One of the techniques reviewed, for the monitoring of deposited dust, is the so-called 'sticky pad' gauge. It is noted that a measure of directionality can be obtained from the related 'sticky cylinder' gauge.

Sticky pad gauges were described by Beaman and Kingsbury in 1981 and have since become a very popular technique for the assessment of deposited dust due to their low cost and ease of use. The basic system consists of a 15 cm square of sticky white 'contact' or 'fablon' sheet fixed on a backing board. This is then placed at the monitoring location with 75% of the sticky surface exposed and the remainder covered as a reference area. Following exposure the previously unexposed reference area is revealed and the whole surface sealed. The reflectance of the exposed section, which was subject to deposited dust, is compared to that of the reference area using a smoke stain

reflectometer. The results obtained are expressed in terms of percentage obscuration or Effective Area Coverage (EAC) with the results normalised to give EAC as a percentage per day of exposure. It is possible to compare the results with typical values for various locations ranging from rural to industrial and to relate these to likely public response.

The sticky gauge concept was taken a stage further by Pearce and Smith with the development of a directional sticky gauge. These consisted of a strip of sticky plastic wrapped around a vertical cylinder placed on a pole 1.2m above ground surface. A shade chart or reflectometer can then be used to assess dust levels against direction.

Although primitive, sticky gauges have a number of obvious advantages:

- Low capital and running costs mean that many locations can be monitored around an industrial site.
- Vandalism of the gauges is possible, even probable, but results in little capital loss.
- Simple to use with the result that effective measurements can be taken with the minimum of staff training.
- Members of the public can 'see' the results and readily relate to them.

The University of Leeds Department of Mining and Mineral Engineering has been carrying out research into the design and analysis of sticky gauges for a number of years. This article details progress made on analysing exposed directional gauges with images obtained via a flat bed scanner connected to a computer and analysis with software developed by the authors. Gauge design has also been refined to include a deposit and directional gauge in one unit for parts costing less than £50.

Gauge Design

Given that one of the great advantages of sticky gauges is their low cost, a design was contrived employing parts readily available from most local builders merchants. The modified gauge is shown in Plate 1 and can be seen to be constructed of mainly plastic pipe parts as listed in Table 1. The parts listed also allow for the construction of a carrying container to avoid contamination of the gauge in transit. The design shown is only a suggestion and many similar effective designs would be possible using other alternative parts.

Field experience has shown that the best material to use for the sticky surfaces is heavy duty sticky plastic of the type used for covering books and that this can be effectively fixed to the gauge by standard masking tape or cable ties.

The design has proven robust in all weather conditions and has not, as yet, attracted the attention of vandals.

Table 1: Parts List of a 'Leeds' Style Gauge

<i>Plastic soil plug:</i> Marley special part. For top: deposit gauge.
<i>Plastic drain pipe:</i> 330 mm of 76 mm of pipe. For main body.
<i>Drain pipe socket:</i> 76 mm drain pipe socket. For base of main body. Cut a 2 mm vertical slot in socket.
<i>Jubilee clip:</i> Fix over socket to secure to mounting pole.
<i>Mounting pole:</i> 1.5 mm of 110 mm steel pipe.
<i>Plastic soil pipe:</i> 400 mm of 110 mm plastic soil pipe with socket. For carrying container.

Field Procedure

Clear sticky backed plastic is cut into sheets of approximately 260 x 190 mm. The backing paper of each sheet is then scored with a sharp knife to leave a 10 mm border on both of the long sides and vertically to match the diameter of the pipe (approximately 215 mm). The sheet is then wrapped around the gauge with an overlap of about 45

mm giving a reference area. The sticky plastic is fixed in place with masking tape with the overlap joint orientated towards compass north. The gauge can then be exposed by removing the backing paper from the area previously scored.

The deposit gauge is a departure from the normal design in that it is circular in shape. Sticky plastic is cut to size by using the gauge top as a template. It has been found that the easiest shape to score out as an exposed surface is a triangle leaving three sections as reference areas. The sticky surface is then fixed to the gauge top with clips, either of the 'bulldog' or 'supa clip' types and exposed.

Plate 1: Photograph of a 'Leeds' Dust Gauge



Post-field Procedure

Following exposure of the gauge at a monitoring location the unit is removed to a warm, dry, dust-free room for at least 24 hours to allow any moisture to evaporate. Both the deposit and directional gauges then have all the remaining sticky surfaces exposed and are sealed by the application of A4 sheets of clear film of the type used to produce overhead transparencies on photocopiers. The boundary between the exposed and reference areas is then marked on the clear film with a permanent black pen. The sample can then be trimmed to size and is ready to be scanned.

Analysis

Commercially available software is used to control a flat bed scanner. This is set to read grey scale images with a resolution of 50 d.p.i. A typical scanned image is given as Figure 1 showing both dust and other contamination along with the north line and reference area (to the right of the north line).

Figure 1: Example Scanned Image of a Directional Sticky Dust Gauge



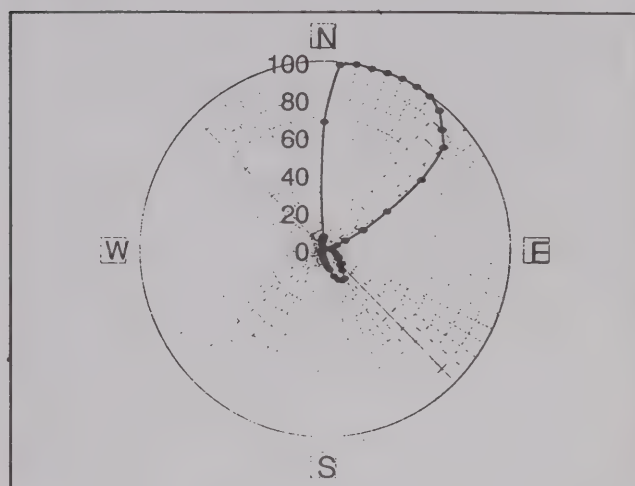
Software has been developed by the authors to process the images thus obtained to determine the dust coverage on the sheet by comparing the sample and reference areas on a grey scale of 1 to 13. The software displays the full scanned image on the computer screen and allows for the user to select the reference area and to block out any non-dust contamination such as insects by means of a mouse pointer. Image analysis is then carried out on a pixel by pixel basis. The grey scale value of the darkest pixel in the reference area is determined first. Each pixel in the main area of the image is then compared to this reference pixel and is assigned as dust if it is darker. All other pixels are assumed not to be dust. The image is then processed to give a level of dust contamination with direction over 5 degree intervals. This data can then be exported to any spreadsheet for additional analysis and plotting.

As the data obtained from this analysis does not depend on reflectance and is therefore not directly related to effective area coverage, the authors have called the measurement absolute area coverage.

Figure 2 shows the result of processing the image given as Figure 1 and plotting the result as a radar plot. The authors have found this style of output to be especially useful as it can easily be compared to wind data and even transferred directly to a plan of the site.

To date processing of the deposit gauges has been carried out using the standard reflectometer methods but it is planned that an updated version of the software will also be capable of processing computer scanned images of these gauges.

Figure 2: Radar Plot of AAC Against Bearing for the Image given as Figure 1



Conclusions

As a result of the research to date, the authors consider that the method outlined in this article has a number of significant advantages over the standard methods:

- the dust gauges can accurately determine the direction from which the dust originated;
- the scanner uses all of the dust image, rather than the present accepted methods which allow the operator to select areas to be used;
- the software is quick and easy to use and does not require any specialist knowledge on the part of the operator;
- the scanner can determine the percentage of the image that has been covered with dust;
- extraneous matter, such as insects, can be deleted from the scanned image;
- the results from the scanned image can be compared with weather data to determine the likely scale of the dust nuisance;
- the method outlined is a simple and cost effective way of monitoring environmental dust levels around industrial installations.

Future Developments

The resolution used in the work to date has been 50 d.p.i. resulting in an average image containing some 200,000 samples with a pixel size of about 500 microns. This resolution was chosen simply because it meant that the image of an A4 sized gauge could be displayed on a standard VGA computer display. The processing technique

described works on the basis that if a pixel has changed colour it is dust. This must cause errors in the final value determined for 'absolute area coverage' in that the dust particle may not be as big as 500 microns. Modern scanners are capable of scanning images with resolutions of better than 300 d.p.i. giving a pixel size of less than 84 microns. Such resolutions would clearly reduce errors but increase the computer storage required to process the images. Work is planned to look at these aspects and possibly increase resolution whilst reducing size to optimise the system.

The method outlined is not limited to monitoring "grey" dust only. As the sticky pads are transparent, any colour of dust can be scanned providing that a contrasting background is used. Thus dust nuisance from a limestone quarry could be measured providing the gauge was scanned employing a black background. Modifications are required to allow the software to process these images but the existing software has been used with the scanned images 'inverted' in an image processing package prior to analysis. Future developments will look at the potential of employing full colour images to investigate the possibility of discriminating between dust sources.

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**LITIGATING
COMMUNITY
ENVIRONMENTAL LAW**

*Friday 27 June,
Imperial College London*

Environmental legal disputes increasingly raise issues of Community environmental law. The trend will continue with the European Commission recently stressing the need for national courts and authorities to take a lead role in ensuring full implementation of Community environmental obligations.

This one day conference brings together some of this country's leading experts to examine the implications of contemporary law and practice. It will be of major importance to lawyers and non-lawyers working in local government, the public sector and industry who increasingly need to know the real significance of key doctrines such as direct effect, Frankovitch, and sympathetic interpretation.

Speakers include: Lord Woolf, Master of the Rolls; George Kremis, Head of Legal Services, DG XI; Professor Richard Macrory; Derrick Wyatt QC; Nicholas Forward QC; David Baldock, IEEP; David Anderson, Barrister; John Salter, Denton Hall; Robert McCracken, Barrister. Sessions are to be chaired by Mr. Justice Carnwath, Judge Andrew Geddes, Jeffrey Jowell QC.

Conference fee:

£140 (£90 for academics/NGOs - limited).
Places are limited so early registration advised.

For registration contact:

*Sally Verkalk,
Imperial College Continuing Education Centre,
Room 515 Sherfield, Exhibition Road,
South Kensington SW7 2AZ.
Tel: 0171 594 6882/6881; Fax: 0171 594 6883;
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CASELLA - THE SUREST MEASURE OF A CHANGING WORLD

UPDATE

ENVIRONMENT AGENCY & LOCAL AUTHORITIES

The Environment Agency and local authority Associations (ACC, ADC and AMA) have signed a Memorandum of Understanding. The parties intend that the Memorandum will promote sustainable development by establishing a lasting framework for consultation and cooperation in order to make the best use of resources.

Shared environmental responsibilities between the Agency and local authorities include: air quality; flood defence; water resources; contaminated land; strategic waste planning; development plans; planning applications; and information provision. Four principles will inform the way in which respective responsibilities are carried out:

- **Transparency** - the parties are committed to making their workings as transparent as possible to each other and the public;
- **Information** - the parties agree as a general principle to the free exchange of information, without charge, where this is necessary for the discharge of each party's statutory responsibilities;
- **Consultation** - the sides commit themselves to the principle of consultation in its widest sense, both formally and informally, on any issue which significantly affects the interests of the other. The Agency and the local authority Associations, on behalf of member authorities, agree to participate in a national forum;
- **Cooperation** - recognising that protection of the environment involves much more than enforcement of the law, the sides acknowledge the other's desire for a proactive role and undertake to cooperate with each other at all levels for the well-being of the environment.

LOCAL GOVERNMENT ASSOCIATION

1 April 1997 saw the merging of the Association of County Councils, the Association of District Councils and the Association of Metropolitan Authorities to form the Local Government Association. By merging the Associations believe that time and money will be used more effectively and that a single voice for local government will be more powerful.

The LGA is using the AMA's offices in Great Smith Street and those of the ADC in Chapter Street, London, until suitable premises can be found. For the time being, the LGA can be contacted at 26 Chapter Street, London SW1P 4ND; Tel: 0171 834 2222; Fax: 0171 834 2263.

TRANSPORT AROUND TOWN

The Round Table on Sustainable Development published its fourth transport-related report in mid-February. *Getting Around Town - A Case Study of Aspirations and Obstacles* looks at transport and sustainable development, using the Northampton area as a case study.

Over the past 20 years, the population of the Northampton area has grown rapidly, with much of the new housing, industrial and commercial development being on sites that are highly dependent on car access. Traffic in Northamptonshire increased by 180% between 1977 and 1995 with both public transport and cycle use below the national average. Development is still continuing at a rapid rate and Northamptonshire County Council has estimated that traffic levels could increase by a further 50% over the next ten years.

The report identifies five main obstacles to more sustainable transport patterns in the area and sets out recommendations for overcoming these:

- **The location of new development** in Northampton is still largely determined by decisions taken 20 years ago which assumed increased car and lorry use. Radical **changes in land use planning** will be needed and must be reflected in development plans.
- **Competition between areas for economic development** can mean that local authorities overlook the longer-term costs of policies that rely heavily on cars and lorries. Policy makers must find a way of **allowing competition for inward investment** and consumer spending without undermining sustainable development.
- **Businesses favour development on greenfield sites** because they are usually cheaper even though such developments often impose wider environmental and social costs. **The developers and users of such sites, rather than the country as a whole, should bear such costs.**
- **Local authorities do not have all the powers they need**, e.g. to ensure that a coherent network of bus services is provided; they are also hampered from taking a comprehensive approach to transport spending because of the fragmented and short term way in which government spending allocations are determined.
- **The immediate problems caused by increasing vehicle use in Northampton are limited** - road congestion and air pollution levels are not severe. As a result there is little pressure from people or businesses for radical

changes. **Local authorities and others must do more to raise public awareness** of the fact that policies based on expanding car use are not in the longer term interest of people or businesses.

Copies of *Getting Around Town* are available from the Round Table Secretariat, John Adams, P1/023, 2 Marsham Street, London SW1P 3EB.

THINK BEFORE YOU TRAVEL

This new leaflet from the Department of Transport sets out what everyone can do to help make travelling in and around towns and cities easier and more pleasant by reducing traffic congestion and pollution. Over 60% of car journeys are under five miles and this leaflet aims to encourage people to consider using trains, buses and bicycles instead of the car. Daily commuting journeys and school runs are two of the areas targeted by the leaflet as ones where there may be a viable and safe alternative to using the car.

The leaflet is available nationwide and will support local authorities and community organisations in their work to raise awareness about travelling habits and to encourage people to think twice about how they are travelling. Copies of the leaflet can be obtained free of charge from the Department of Transport, 76 Marsham Street, London SW1P 4DR, Tel: 0171 271 5622.

ACTION ON TRANSPORT POLICY AND CAR TRAVEL

Assessments and action plans designed to meet new air quality standards in UK towns and cities by early in the new century will fail if Government does not take national action and free up and support local authorities in radical measures. This was the central message from a conference in January on Transport Solutions for Local Air Quality Management organised by PTRC Education and Research Services.

Amongst the challenges set by the participants were:

- *To government and national politicians:* stop shying away from proposing reductions in car ownership and recognise that it is an essential element in achieving less road travel and meeting air quality standards. Local authorities' calls for legislation to help them reduce the extent of private non-residential car parking should be supported.
- *To parents:* a number of reports have pointed out that ambient pollution levels inside cars are higher, particularly in the back of the car, than on the street. Parents should be aware of this: escort journeys (e.g. school runs) have been the most rapidly growing type of travel undertaken by car in recent years.
- *To local authority politicians and professionals:* air quality can only be addressed by multi-disciplinary means and by "removing professional and departmental cultures and walls".

NOISE GUIDANCE

The Chartered Institute of Environmental Health has recently published two sets of guidance for local authority officers.

Good Practice Guidance for Police and Local Authority Co-operation provides guidance on what is considered as a minimum standard of cooperation between the Police and LA when dealing with noise complaints. The Guidance has been circulated to all local authorities and police forces in England, Wales and Northern Ireland.

Guidance on the Creation and Maintenance of Effective Noise Management Policies and Practice for Local Authorities and their Officers aims to encourage LAs to review their noise policies and practices to ensure that they meet legislative requirements. Guidance is also provided on appropriate and effective noise control policies and practices. Finally the Guidance aims to encourage consistency of service while enabling individual authorities to deliver a service appropriate to the local circumstances and needs. While the Guidance applies to England and Wales, the principles can be adopted for Northern Ireland and Scotland, taking account of the legislation which applies there. Copies of this Guidance have been circulated to all local authorities in England, Wales and Northern Ireland.

Additional copies of both sets of Guidance can be purchased from CHG Ltd Publications, Tel: 0171 827 5882.

NATIONAL NOISE AWARENESS DAY

Following the success of International Noise Awareness Day in 1996, members of the DOE Noise Forum have agreed to run a similar initiative this year. However, the planned April date for INAD this year is a difficult one for central and local government. Instead there will be a UK National Noise Awareness Day on **23 July**.

Once again NSCA has agreed to coordinate activities and will be sending out information packs to local authorities, national bodies concerned with noise, and to the media. We hope that local authority noise control specialists will use the opportunity to organise awareness-raising events. More details in the next edition of *Clean Air*.

NOISE WEB PAGE

PDA Ltd, an acoustic consultancy has set up a web page as a service to anybody seeking information on acoustics or noise-related problems. It is expected that it will be of particular value to health and safety and environmental practitioners, EHOs, factory inspectors, planners, architects and lawyers. The home page, which is available on all the major search engines, can be accessed on: http://ourworld.compuserve.com/homepages/PDA_Ltd/

MEMBERS' NEWS

Three NSCA member organisations were involved in a clean air press launch, as **London Transport Buses** announced that 25% of bus route miles in London are now run using ultra-low sulphur 'city' diesel fuel marketed by **Shell** and two other suppliers. Emissions from older buses run on the fuel compare favourably with the latest "Euro 2" engines. Two hundred and fifty Routemaster buses are being fitted with **Johnson Matthey** oxidation catalysts to further improve emissions. The launch was attended by Transport Minister John Bowis, and by NSCA Secretary General Richard Mills who commented: "London Transport Buses have shown that this technology works and can make a real difference to older buses". Pictured below are John Bowis and Clive Hodson, Managing Director of London Buses.

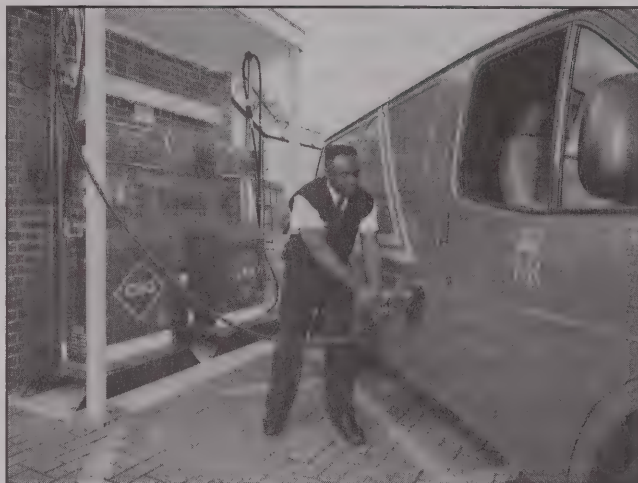


Sainsbury's have put together an information pack on noise, including leaflets produced by NSCA and DOE. The pack has gone out to 100 of their stores.

The UK's largest electric vehicle test fleet has been launched on the streets of Coventry. Fourteen electric Peugeot 106 cars and vans are being used in real-life working situations as part of a project run by the Energy Savings Trust. NSCA members participating include **Coventry City Council** and **PowerGen**.



A recent NSCA seminar on alternative fuels saw an interesting debate about the relative merits of compressed natural gas (CNG) and liquefied petroleum gas (LPG). Now **Ford** and **BP** are cooperating with the Post Office in a two-year trial comparing the two. Twenty-seven Transit vans, including four different CNG variants, three LPG variants, plus diesel and petrol control vehicles, will be evaluated for engine wear, performance and emissions.



Rochester on Medway is the latest local authority to introduce "company bikes" for staff on council business. The bikes are part of a policy to discourage unnecessary car journeys and promote environmentally-friendly alternatives. Rochester has a growing network of cycle routes.

Over seventy delegates attended the NSCA seminar on **indoor air quality** at the NEC in February. Proposals to designate Environment as a sixth key area in the Health of Nation strategy were likely to be hindered by lack of knowledge and understanding among health professionals, according to NSCA President Dame Barbara Clayton. She welcomed the inclusion of indoor air quality in the Environment areas, but said this should be extended to include exposure in cars, buses and trains, where many people spend significant amounts of time. Exposure of pregnant women and the foetus was also inadequately addressed, she said.

Ian MacArthur of CIEH issued a rallying call to EHOs to put the "Health" back into environmental health, noting that links between local authorities and health authorities need improving. The Health of the Nation initiative was a golden opportunity to promote the concept of healthy homes - including indoor and outdoor air quality, radon, lead in water, safety and energy efficiency, he said.

Dr Linda Smith of the Department of the Environment said that there was still time for responses to the consultation paper to be submitted. DOE was already providing information on indoor air pollution to assist EHOs with information campaigns. Dr Smith also revealed that new guidance on NOx from gas cookers would be issued shortly, aimed particularly at homes with babies and people with respiratory disease.

A resource pack based on papers presented at the seminar is available from NSCA, price £25.

The seminar also provided an opportunity for the Society's Divisional Secretaries to meet and discuss future development of the NSCA Divisions.

Divisional News

Eighty-seven members of the **East Midlands** Division attended a meeting at Rushcliffe BC devoted to the Environment Agency. Lower Trent Area Manager Brian Waters, IPC Manager Frank Farrell and Senior Environment Officer Nick Suner made presentations on aspects of the Agency's work, and a lively discussion followed. After lunch, visits were made to the Eastcroft municipal waste incinerator, Meadow Lane analytical laboratories and Holme Pierrepont water sports centre.

Members were sorry to hear of the retirement of **Jane Inglefield**, a past Chairman of NSCA and a member since 1974. Jane represented High Peak BC on the East Midlands Divisional Council and was a member of the National Noise Committee.

The **North West** Division met on 9 April at Warrington Town Hall; Chairman Paul Cooney was present to talk about proposals for restructuring the Society. Last December, two member authorities - Oldham and Knowsley - played host to a Peugeot 106 electric vehicle which was lent free of charge (although the batteries did need recharging). The car was used by officers, councillors and at schools, creating substantial interest.

A joint NSCA North West/MAPAC seminar on air quality management and waste is planned for May. The meeting is a precursor for the Mutare workshop which is being organised in the north west together with international partners in Harlaam, Zimbabwe and Eastern Block countries. Details available shortly.

NSCA restructuring was the main item on the agenda of the last meeting of the **West Midlands** Division. In the afternoon members visited Foseco (FS) Ltd near Tamworth. The company manufactures a wide range of specialist products for the metallurgical industries.

Sadly pressure of work has forced Cllr Bill Hancox to resign as Divisional Chairman; Cllr Steve Norman takes over until the AGM which is on 3 July - NSCA Chairman Paul Cooney will be the speaker.

Forthcoming Divisional meetings - see page 60

Elsewhere...

One of the last joint acts of the local authority associations prior to merger into the Local Government Association, was to sign a memorandum of understanding with the Environment Agency (see also Update section of this *Clean Air*). Pictured here are John Harman of the AMA, Lord de Ramsey of the Agency, Joyce Edmond Smith of the ADC and Derek Bateman of the ACC. The memorandum covers cooperation on matters including air quality management plans, waste local plans and Local Agenda 21 initiatives.



Goodbye to a number of familiar faces at DOE who are moving on to better, or at least different things ... Brian Etheridge who bestrode the local air quality management world like a colossus, noise supremo Mary Dyer and her colleagues Phil Clapp and Pam Wynne, and John Hobson of the Energy and Environmental Management Directorate.

Throwing out some old files, we came across the papers on the (successful) NSCA campaign to have emissions testing included in the MOT. Transport Minister **Cecil Parkinson** eventually conceded that this would be a good idea, but clearly hadn't grasped the relevance for clean air when he spoke at a news conference: "If you included engine-tuning in the MOT test you could reduce emissions by proper tuning by four per cent." Yes, Minister. "So you could have four per cent more motor cars and no more emissions". Er...up to a point, Minister.

Finally, which famous anti-noise campaigner went to Buckingham Palace to collect a well-deserved MBE, and returned to discover that her cat had set off the burglar alarm? We are sworn to silence ...

BOOKS & REPORTS

The Environment Acts 1990-1995. *Stephen Tromans, assisted by Mike Nash and Mark Poustie. Sweet & Maxwell, 1996. ISBN 0-421-55810-5. £40.00.*

Invaluable reference book, now updated to include the text of the *Environmental Protection Act 1990* as amended by the *Environment Act 1995*, and the full text of the 1995 Act. Each Act is preceded by an extensive introduction as to its origins (consultations undertaken, relevant reports etc. and its relationship to EU legislation). Detailed notes follow each section of the Acts, together with commencement dates, definitions, and other background notes. These latter are particularly useful, often providing an interpretation of the section in plain language, as well as explaining the history or thinking behind it, drawing attention to guidance notes or circulars and case law. This book is current to February 1996 (the date of its preface).

The Green Triangle: An Environmental Legislation Guide for Businesses in Northern Ireland. 1997 edition. *ARENA Network (Northern Ireland) and Cleaver Fulton & Rankin, Solicitors. Available from ARENA Network, Price £18; Fax: 01232 461471.*

Although the sub-title suggests that the book is for business, it will in fact be essential reading for anybody needing a brief but comprehensive introduction to environmental and related legislation in Northern Ireland. Each chapter summarises the issues, relevant EU measures, current NI legislation and who it is enforced by, as well as mentioning forthcoming legislation. At the end of each chapter there is a list of useful contacts, with a more detailed list contained in an appendix. The ARENA Network is administered by Business in the Community Northern Ireland.

Environment Industry Yearbook 1997. *Macmillan Press Ltd, 1996. £75.00. ISBN 0-333-66571-6.*

Company listings and table of specialisations for each of the main environmental fields - including air pollution control, contaminated land remediation, noise & vibration control, waste management, etc, as well as laboratory analysis services and table of EPA prescribed substances specialisations, and environmental consultants. A listing of computer services and software packages will also be of considerable value to many users of this book. As with many Directories, much of the introductory section which includes government departments and regulatory agencies is already out of date, including as it does HMIP, the NRA and waste regulation authorities, all of which no longer exist and have of course been part of the Environment Agency (which is listed) since 1 April 1996.

Ecotaxation. *ed Timothy O'Riordan, Earthscan, 1997. £15.95. ISBN 1853832626.*

This collection of essays sets out to explore the history and context of two theories of ecotaxation. The first is the 'polluter pays principle' - concerned with the notion that correctional charges are imposed on activities which have a damaging effect on quality of life or the environment. The other involves a more ambitious policy shift - aiming to put taxation on a different basis, away from income and labour and on to environmentally damaging activities. The editor sees ecotaxation increasingly as an issue of social rather than environmental policy - reflecting the ethics of sustainable development and Agenda 21. Unemployment and social deprivation, he states, lead to "uncared for people, unlikely to care for each other, let alone the planet". Taxation that promotes sustainable use of resources, including people, would be more conducive to sustainable development. Examples are cited of why, even though such measures have long been promoted by economists, ecotaxation has taken so long to find political favour. The difficulty of making the shift to such a system politically acceptable, where there are so many unknowns about long term effects, and little chance of immediate tangible results is one reason. The UK landfill tax is analysed in this context as the first example of a UK tax with sustainability as its goal. With contributions by leaders in the field of economics and environmental policy, the book gives an overview of the status of ecotaxation set against the current political climate.

Measuring the Real World. *Heifer Thiessen, John Wiley, 1997. £18.99. ISBN 0471968749.*

Subtitled 'A Textbook of Applied Statistical Methods' the book aims to give undergraduates in geographical and environmental disciplines competence in elementary data treatment. Individual chapters on statistical techniques use socio-economic data from around the world to demonstrate data handling and presentation.

Environment and Health 1 - Overview and Main European Issues. *World Health Organisation, 1996. Sw.fr.19. ISBN 928901332X.*

Developed jointly by the European Environment Agency and WHO European Centre for Environment and Health, this publication draws attention to environmental issues that have an impact on the health of the people of Europe. The main health problems of Europe are outlined, followed by an examination of three major issues - air pollution by suspended particulates, microbiological contamination of drinking water and road traffic accidents. It looks not only at effects but at practical solutions that can be implemented now.

Energy from Wastes. *Brian Price, Financial Times Energy Publishing, 1996. £350. ISBN 1853346195.*

This report is intended to present an overview of the principles and practice of recovering energy from waste as perceived from the latter half of 1996. Principle technologies are discussed and a wide range of examples of schemes at different stages of development are provided. Chapter 1 examines energy and waste practices and policies in Europe and the US. Subsequent chapters cover economic and environmental benefits; a comprehensive overview of technologies; current deployment of technologies in Europe and around the world and pollution problems and control. The report provides a comprehensive overview of current practice in waste to energy projects.

Managing Contaminated Sites. *D. Café Asante-Duad, Wile, 1996. £40.00. ISBN 0471966339.*

This book addresses issues relevant to the investigation and management of contaminated land. It looks at problem diagnosis and site restoration. Methodologies for developing scientifically justifiable, technically feasible and economically viable corrective action are set out in detail.

Global Warming - can civilisation survive? *Paul Brown, 1996. £12.99. ISBN 0713726024.*

As environment correspondent of *The Guardian*, covering global warming for ten years, the author provides an authoritative personal view of how the issue has, and should be, confronted. Part One details the history of global warming and attitudes to it. Parts Two and Three examine causes and effects and Part Four the politics of climate change.

Released Substances and Their Dispersion in the Environment. *Environmental Analysis Co-operative, HMSO, 1996. £19.50. ISBN 0117020109.*

This manual has been written in response to widespread concern about the requirements under the *Environmental Protection Act 1990* to provide data on chemicals released

from processes, their dispersion and ambient environmental quality. Industries, government, consultants and environmental bodies cooperated to produce this as a toolkit to assist the IPC manager. The Guidance is divided into three main sections covering Environmental analysis, Dispersion and fate and Ambient quality. It includes an explanation of environmental analysis, application of the methodology and a worked example and presentation.

The Use of Biomarkers in Environmental Exposure Assessment. *Institute for Environment and Health, 1996. £20.00. ISBN 1899110070.*

Exposure to a chemical pollutant may be reflected by an increased amount of that pollutant or its breakdown products in the body. Increased levels of these biomarkers may provide an index of personal exposure. The use of biomarkers has aided studies on the effects of lead, PAH and dioxins, however there are no biomarkers currently available to aid the investigation of urban gaseous pollutants. This report includes papers from an expert workshop on the issue held in December 1995. It examines the use of biomarkers, potential applications, those currently available and that may be available in the future.

Integrated Environment, Health and Safety Management. *Andrew Gillies, Stanley Thornes, 1996, £35. ISBN 074872504.*

Written from the point of view of business managers confronted by integrating environmental, health and safety management, this report describes options for appropriate management systems. It gives models of tried and tested systems, together with practical advice. Chapters cover the development of health and safety and environmental protection, management systems and theories, benefits and practice of integrated systems, getting started and future trends. The report aims to promote the development of this rapidly evolving field.

FUTURE EVENTS

23 APRIL - Perspectives on Pollution Control Policy in Scotland

This conference, which takes place one year after SEPA came into operation, provides an opportunity to examine the repercussions of reorganisation and assess the future of pollution control in Scotland.

Venue: Quality Station Hotel, Perth

Details: Conference Organiser, School of Public Administration & Law, The Robert Gordon University, Tel: 01224 262907; Fax: 01224 262929.

10-18 MAY - Environment Week

10 JUNE - OPENCAST COAL MINING:

Can we measure the health effects in local populations

To provide a forum for all those concerned with the potential health effects, including those responsible for planning decisions and dust monitoring, for the exchange for ideas and information.

Venue: Assembly Hall, Torfaen County Borough, Cwmbran.

Details: Jacqui Tate, Environmental Management Department, Torfaen County Borough, Fax: 01633 648463.

14-22 JUNE - Green Transport Week

18-20 JUNE - The Challenge of Environmental Management in Metropolitan Areas

This conference, organised jointly with the Institute of Commonwealth Studies, will mark the first anniversary of Habitat II and will bring together expertise from around the world to examine achievements in dealing with urban environmental problems in the world's metropolitan areas.

Venue: University of London.

Details: Julio Davila, Development Planning Unit, University College London, Tel: 0171 388 7581; Fax: 0171 387 4541.

23-27 JUNE - Environmental Management and Auditing

Short course organised jointly by Robens Institute and Farnborough College of Technology offering post graduate training for environmental management and environmental health professionals. (Note: this is also one of the modules of a part-time modular course - for full details contact the Course Coordinator.

Venue: University of Surrey.

Details: Ms Jennie Lynch, Tel: 01483 259935.

30 JUNE - 3 JULY - Engine Emissions Measurement

A short course to explain the function of heated on-line gas analysis systems for CO₂, CO, O₂, UHC, NO_x and SO_x measurements from gas turbine, diesel and spark ignition engines using liquid and gaseous fuels. Regulated gaseous emissions measurement including remote roadside monitoring, non-regulated emissions using new types of instrumentation, diesel and spark ignition particulates measurement, etc.

Venue: University of Leeds.

Details: Jamie Strachan, Department of Fuel and Energy, University of Leeds. Tel: 0113 233 2494; Fax: 0113 233 2511.

3-4 JULY - Eco-Management and Auditing Conference

Annual conference which aims to facilitate in-depth discussion of environmental management systems, associated standards and auditing methodologies.

Venue: The Manchester Conference Centre.

Details: ERP Environment, Tel: 01274 530408; Fax: 01274 530409

23 JULY - National Noise Awareness Day

22-23 SEPTEMBER - Incineration of Municipal Waste with Energy Recovery

Short course to provide an introduction for all those considering the incineration option for the disposal of municipal solid waste. To provide detailed coverage of the incineration process and associated problems for those already involved in incineration. Specialist lectures on the theory and practice of incineration including combustion, incinerator design, refractories and pollution as well as practical experiences of incineration of municipal waste.

Venue: University of Leeds.

Details: Jamie Strachan, Department of Fuel and Energy, University of Leeds. Tel: 0113 233 2494; Fax: 0113 233 2511.

FORTHCOMING NSCA EVENTS

Regional Seminars on Air Quality, Planning and Transport
to be held in association with the Local Government Association

Tuesday 3 June, Leicester

Friday 6 June, Bury

Wednesday 11 June, London

Thursday 19 June, Bristol

Wednesday 11 June 1997

**UK Dispersion Model Users Group
London**

Tuesday 16 September 1997

**Training Seminar
NEC Birmingham**

Monday 20 - Thursday 23 October 1997

Environmental Protection 1997

NSCA's 64th Annual Conference - Glasgow

Tuesday 18 November 1997

**Training Seminar
NEC Birmingham**

Tuesday 25 November 1997

**UK Dispersion Model Users Group
London**

**For list of forthcoming Divisional
meetings and events see page 60.**

For further details please contact
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136 North Street - Brighton BN1 1RG

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CLEAN AIR

AND ENVIRONMENTAL PROTECTION

July/August 1997

- Progress in Air Quality Management
- Indoor Air Quality Assessment
- The Long Distance Food Trade

Volume 27

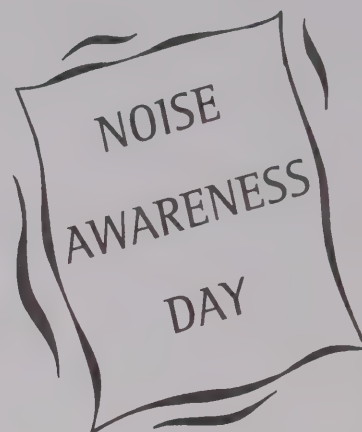
Number 4

**NATIONAL SOCIETY FOR CLEAN AIR
AND ENVIRONMENTAL PROTECTION**

Have You Heard?

Wednesday July 23rd is

National Noise Awareness Day (NAD)



What is NAD?

🔔 The objective of NAD is to increase public awareness and understanding of noise issues by acting as a focus for information campaigns and media discussion. It is being co-ordinated by NSCA with support from the Department of the Environment.

🔔 All over the country, local authorities will be undertaking awareness raising initiatives, encouraging young people and the public to consider noise issues.

🔔 NSCA is surveying local authorities to assess current practice and attitudes to responding to noise complaints.

🔔 A **noise information pack** is available from NSCA containing leaflets and ideas for activities.

🔔 On Noise Awareness Day, NSCA will be providing noise information for members of the public.

What can you do?

🔔 We are looking to participating bodies to make their own contribution according to their particular capacities and expertise. Last year many local authorities and other organisations participated in International Noise Awareness Day, which generated considerable interest in the national and local media.



With rising concern about our increasingly noisy society and the imminent introduction of the Noise Act, now is the time to sound off about noise.

For more information contact:

Mary Stevens, NAD Co-ordinator, NSCA, 136 North Street, Brighton, BN1 1RG

Tel: 01273 326313 Fax: 01273 735802 Email: info@nsca.org.uk <http://www3.mistral.co.uk/cleanair>

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The National Society for Clean Air and Environmental Protection produces information, organises conferences and training events, and campaigns on air pollution, noise and environmental protection issues. Founded in 1899, the Society's work on smoke control led to the Clean Air Acts. More recently NSCA has been influential in developing thinking on integrated pollution control, noise legislation, and air quality management.

NSCA's membership is largely made up of organisations with a direct involvement in environmental protection: industry, local authorities, universities and colleges, professional institutions, environmental consultancies and regulatory agencies. Individual membership is also available to environmental specialists within industry, local authorities, central government, technical, academic and institutional bodies.

Members benefit from joining a unique network of individuals who share an interest in a realistic approach to environmental protection policy; from access to up-to-date and relevant information; from reduced fees at NSCA conferences and training events. They contribute to NSCA's regional and national activities; to environmental policy development; to translating policy into practice; to the Society's wide-ranging educational programmes.

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EDITORIAL

Who's In, Who's Out

With any change of Government or Cabinet reshuffle, much time and effort is devoted by the 'serious' political commentators to the pecking orders of Ministers, to who has or has not a seat at the Cabinet table, to the numbers of Junior Ministers in each Department and, above all, to the way Departments are divided or brigaded.

Certainly, such changes can be of some significance - but usually not much. The realities do not go away, whether the inherent conflicts are played out, and the difficult balance struck, between two separate Departments or between the different divisions of a single Department.

Nevertheless, such changes can sometimes convey significant messages. Against this background, the brigading of Environment and Transport - particularly if they become a single Department - could be an important step forward for those concerned with a sustainable environment, and particularly for air quality. The need to tackle transport emissions, and to get more effectively to grips with the air quality consequences of urban traffic congestion, is a key theme of the National Air Quality Strategy on which there is unfinished business. Insofar as the changes may signal that environmental impacts will be given greater weight in transport policy, the merging of the two Departments is therefore to be warmly welcomed.

So too is the inclusion of 'regional development' in the new title. The concept of 'regional development' may have a somewhat 1970s ring, but the reality is that many sustainability issues, and not least air quality, do have a significant regional dimension which needs some acknowledgment. In this case, however, the welcome must be qualified by a concern that any focus on institutional tinkering at regional level should not be one more obstacle in the way of the process of retrieving the status, powers and resources of local government, which have been so grievously impaired in recent decades with inevitable consequences for their effectiveness as front-line managers of the local environment.

What changes in titles and administrative machinery do not in themselves offer is the radical agenda needed both on air quality and environmental sustainability. This was absent from the manifestos of all main political parties. Nevertheless, in the case of the new Government, its commitment to objectives at least as demanding as those in the present National Air Quality Strategy, and its proposals for an environmental task force and for wider use of economic and fiscal instruments to achieve environmental objectives could provide a firm ground on which to build. Over the coming months NSCA will play its part in promoting the sort of necessary radical agenda which can be built on these foundations. The four-point plan to further redress the effect of traffic on urban air quality, outlined elsewhere in this issue, and the proposals the Society will shortly be publishing for new approaches to local environmental management, already provide a way forward.



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NSCA NEWS & VIEWS

Developing the Society's Policies

Development of new policies to improve air quality and to promote sustainable development is at the core of the NSCA's work. When the Council at its March meeting, unanimously approved proposals for strengthening the structure and operation of the Society (to be put to an Extraordinary General Meeting of the Society on 8 July for ratification), it also considered preliminary proposals for expanding and enhancing the Society's policy development and review procedures. Here, Richard Mills, NSCA's Secretary General, summarises these proposals and how they will help the Society to meet its goals.

The policies of the Society are, and must continue to be, the responsibility of the Council, a broad, elected body representing all interests in the Society; but to do this effectively, it must be able to rely for support on a range of more specialist groups. In recent years much of the burden has fallen on the Society's Technical and Parliamentary & Local Government Committees. More recently this has been complemented by the Local Air Quality Information Exchange Network, which has developed a significant role in developing air quality policy generally and, in particular, in local air quality management. The National Noise Committee is also now firmly established and a widely recognised source of expertise.

What is now clear, however, as we move towards the Society's centenary, is that these arrangements are unlikely to prove adequate. They have served the Society well, but now need to be extended and further strengthened.

Discussion in the Divisions and Committees of the Society, and most recently in Council, has now made clear that the process for developing policy needs to achieve three main objectives:

- following the change of the Society's name to embrace all environmental protection, we need now to make sure that the Society's policy development and review machinery is similarly comprehensive;
- while the overall scope of policy review must be wide, there must be a capability to focus rapidly and flexibly on key issues as they arise. The main policy committees established in particular areas must increasingly operate through smaller working groups with defined tasks and target dates to ensure that policy positions are developed in a timely and effective manner;
- since technical and policy considerations can seldom be separated, we should ensure that they are drawn together at all levels.

The current restructuring proposals, which seek to enhance the Council's policy-making role, will help to ensure that some of these objectives can be met. Along with the proposed Board of Trustees, the Council will take on some of the functions currently discharged by the Parliamentary & Local Government Committee. In addition, the Council will be able to establish ad hoc policy groups to work in particular areas or on specific issues with defined terms of reference and clear target dates.

In the light of discussions so far, it seems clear that at least four groups will be needed from the start simply to carry forward existing commitments and to meet other needs already identified:

- *Industrial and Vehicle Emissions:* this group will be needed to carry forward key elements of the Technical Committee's work in a more focused way; and, in particular, to enable the Society to develop proposals for addressing obstacles to cleaner technology;
- *Air Quality:* the Local Air Quality Information Exchange Network should now be established as a policy committee, addressing the range of issues which need to be pursued to help carry through the National Strategy and recent legislation on air quality management; and to address as yet unresolved issues, such as ground level ozone;
- *Noise:* the work of the National Noise Committee needs to be maintained and extended;
- *Environmental Management:* it is intended that this group will pull together the widening range of work within the Society on environmental management issues, particularly at the local level.

The terms of reference and priorities for such groups will be a matter for further consideration by the Council, but discussions so far suggest that each of the committees will need to be structured and organised so that it can meet three main functions:

- to keep under review and respond to issues as they arise in the relevant area;
- to forge links and maintain liaison with other bodies active in that area;
- to take on specific ad hoc policy development tasks within the area.

The overriding need must be to ensure that the new structure extends the opportunities available for members to contribute to policy development work, as well as enabling the Society to draw in experts from specific fields to help with priority tasks. It is essential that the Society utilises to the full the considerable resources reflected by its membership.

To be successful, the groups will need to operate in an open and flexible manner, but also be geared to clear and specific objectives. In practice they will have to operate at several levels. Each group will need a core of expert members continuously on call to offer advice and support to the Policy Officer in responding to matters as they arise - often at very short notice. On a more proactive basis,

smaller teams, including both members and invited experts, will be needed to undertake specific detailed developmental projects. The groups will then have to offer the widest practicable framework for review and debate on policies emerging from this process. This should include periodic meetings to which all members of the Society declaring an interest in the particular field would be invited. Only by operating at these several levels is it likely that we shall be able to get the essential balance of broad participation and specialist expertise.

Final decisions on new arrangements will need to be made by the incoming Council in October. At its recent meeting, however, the present Council recognised that it needed to begin to lay the foundations now. Accordingly, in consultation with the Society's existing committees, the headquarters is now drafting possible terms of reference and priorities, and assembling the resources and expertise on which they will need to draw. That should ensure there is no loss of momentum when the existing structure is replaced by the extended and enhanced arrangements.

OTHER NEWS

A NEW AGENDA FOR AIR QUALITY

NSCA set a challenging new agenda for air quality management at its Spring Workshop held in Abingdon on 15-16 April. The workshop provides the first detailed response to the UK National Air Quality Strategy, published in March. Although welcoming the Strategy as a landmark in the development of UK pollution control, NSCA points out that the policy measures necessary to ensure its success are not yet all in place. Further action to tackle traffic pollution is particularly needed.

The NSCA is pressing the new Government for a comprehensive package of measures to:

- link road tax to emissions for cars, and provide further tax breaks for 'cleaner fuels' such as gas and ultra-low sulphur diesel;
- establish an identification scheme for different classes of vehicles, to allow the selective exclusion of 'dirty' vehicles from polluted urban areas;
- provide local authorities with powers to require bus, taxi and other fleet operators to meet enhanced emissions standards, and require large employers to introduce 'green commuter' plans.
- tie the declaration of Local Air Quality Management Areas to the provision of additional funds, and establish a national 'know how' fund for experimental and demonstration projects.

At the same time, improvements in air quality must be complemented and reinforced by progress in other facets of

the local environment. Three key commitments will be essential from the new Government:

- the central role of local government must be further reinforced. The Strategy broke new ground, for recent times, in giving new powers to local authorities. If optimum solutions are to be found to local problems, local authorities must be given greater flexibility to adjust and integrate policies and programmes at local level to fit local circumstances. Only they can achieve the best trade-offs and synergies among the wide range of policies affecting local environment quality, including air, noise, littering and waste, which inevitably interact closely;
- local environment management must be better resourced. The £12 million found by the previous Government to fund local environment management was helpful, but it is time to recognise that many aspects of management of the local environment are chronically under-resourced. Failure adequately to maintain the local environment and implement policies related to it lead inevitably to demands for new capital investment and services, which dwarf what is initially saved. The new Government must get away from short-termism and recognise the multiplier effect of adequate funding of maintenance of the local environment;
- the protracted debates on operation of controls on dirty vehicles have also exposed the inadequacy and lack of imagination in our approaches to the enforcement of local environment regulation. The Police Core Tasks Review risks withdrawing the police from many of

these areas, and local authorities are not resourced to move in. Consideration should be given to the development of local warden services capable of getting a grip not only on parking, but on dirty vehicles, excessive noise, litter and other environmentally damaging behaviour.

AIR QUALITY INFORMATION

In our initial response to the proposals for revising the system of air quality bandings, NSCA expressed concern that the proposals would continue to mislead the public. In particular the use of the term “very good” air quality in relation to particles, a pollutant for which there is no known safe level, was unacceptable.

NSCA has now submitted its detailed response to the Department of Environment; a number of suggestions as to how the proposals might be adapted and improved are made. An alternative effects-based air pollution banding system is recommended, and research to evaluate the various policy options proposed.

General Comments

The National Society for Clean Air welcomes the opportunity to comment on the proposals for a new air quality (AQ) information system for the United Kingdom. The NSCA agrees in principle that the proposed three threshold framework (standard, information and alert) could provide an appropriate basis for an AQ public information system. However, the Society does not support either of the sets of descriptors proposed within the consultation paper, as both risk misleading the public and undermining local authority action in support of the objectives set out in the UK National Air Quality Strategy. The Society is also particularly concerned at the proposed treatment of fine particles.

Detailed Comments

The Proposed Three Threshold System: Standard, Information and Alert Thresholds (para 3.3)

The NSCA agrees in principle that the three proposed thresholds - standard, information and alert - could provide an appropriate basis for an AQ public information system for the UK, subject to the comments below. However, it is unclear upon what basis the statement (para 3.3b) that “disamenity may begin to occur” above the standard threshold has been made. The Department should therefore demonstrate a rigorous basis for this statement or withdraw it.

The Descriptors of Air Quality as “Very Good”, “Moderate”, “Poor” and “Very Poor”; and Descriptors of Air Quality as “Very Good”, “Generally Satisfactory”, “Poor” and “Very Poor” (para 3.7)

The NSCA does not support either of the sets of descriptors proposed within the consultation paper, as both risk misleading the public and undermining local authority action in support of the National Air Quality Strategy.

In particular, the NSCA believes that the proposal to describe air quality as “generally satisfactory” or “moderate” when it falls below the Government’s own health-based standards, and is therefore clearly unsatisfactory, would cause considerable public confusion. Surely it cannot be appropriate to describe air quality as “moderate” or “generally satisfactory” at levels at which Air Quality Management Areas (AQMAs) may need to be declared? The use of these descriptors would be likely to undermine public support in situations where local authorities were required to declare AQMAs or take other measures in support of national air quality objectives.

The use of the term “very good” air quality to describe levels of pollution only marginally below the relevant national air quality standard is also problematic. It is not helpful to describe 145 ppb of NO₂, or 48 g/m³ of PM₁₀ as very good air quality.

The Treatment of Threshold Pollutants (para 3.10-3.11)

The NSCA recognises that, subject to legislative developments at a European level, the threshold values selected should be based upon sound independent scientific advice regarding the medical effects of the pollutants concerned. The Society therefore accepts the threshold values proposed for carbon monoxide, sulphur dioxide and nitrogen dioxide and ozone (see page 62 of May-June 1997 issue of *Clean Air*).

However, it should be noted that the use of threshold values based upon running averages presents certain problems with respect to air quality forecasting. The Department is therefore urged to provide guidance to local authorities (many of whom undertake their own forecasting) on the statistical aspects of converting figures for running averages to fixed periods.

Subject to the above, the use of a 15 minute averaging time for the sulphur dioxide thresholds may also bear some further consideration, as it is likely to prove extremely difficult to forecast peaks of such a short duration.

The Treatment of Carcinogens (para 3.12-3.14)

NSCA accepts that it would be inappropriate to classify levels of the carcinogenic non-threshold pollutants - benzene and 1,3-butadiene - within the three threshold system proposed. The Society therefore agrees that these pollutants should be dealt with separately, and that furthermore the respective national air quality standards provide the relevant thresholds against which levels of these pollutants should be assessed over the longer-term.

The Treatment of Fine Particles (PM₁₀) (para 3.15-3.16)

The NSCA considers that it may be possible to accommodate fine particles within the three threshold system proposed. The Society does not, however, believe that it is appropriate to use the descriptor “very good” air quality in relation to particles: a pollutant for which there is

no known no-effect level. To do so would only add to public confusion and undermine the credibility of the proposed AQ information system as a whole.

The Prospects for a Future System of Numerical Descriptors (para 3.22)

Pollution indices are of course used in a number of other countries, including the USA and France. The NSCA believes that the UK Government should play an active role in promoting and funding research into improved methods of communicating air quality information to the general public (including research into the use of numerical indices/descriptors). The results of such research should be published in full and should provide the basis for the informed future development of the UK's AQ information system.

The Balance Between Provision of Current Air Pollution Levels and Air Pollution Forecasts (para 3.23-3.24)

The NSCA welcomes the commitment in the consultation paper to continue to develop the air pollution forecasting service. As the paper acknowledges, accurate forecasts are needed in order to allow individuals who may be affected to take preventative measures and allow regulators to consider whether action may be required. Research is required to improve both the reliability and length of forecasts.

Discussion

In order to facilitate constructive dialogue, the Society wishes to make a number of suggestions as to how the Government's proposals might be adapted and improved. These are outlined in the following section.

Aims of the Air Quality Information System

The consultation document lacks a clear statement of the aims of the proposed system. Without such a statement it will be difficult, if not impossible, to objectively evaluate the effectiveness of whatever system is finally adopted. Any AQ information system for the UK, will clearly have a number of distinct aims. These should include:

- making information concerning current and forecast air quality available to the media and general public in an accessible, interesting and informative manner.
- providing the general public and 'at risk' individuals with timely advice on preventative measures they can take to protect their health during forecast or actual air pollution episodes.
- providing the general public with timely advice on action they can take to reduce their contribution to forecast or actual air pollution episodes.
- providing both local authorities and other relevant bodies, e.g. health authorities, medical practices, etc with warnings so that they can activate contingency plans to reduce the impacts of such episodes.

An Effects Based Approach

In order to more effectively satisfy the aims set out above, the NSCA suggests that consideration should be given to the development of an effects-based banding system. Rather than provide a banding for each individual pollutant, such a system would give a single banding for each day/forecast period. This would have the advantage of keeping the message focused. The banding given would be defined by the pollutant(s) in the highest category in the period in question. The descriptor for this banding would then be supplemented by summary information describing:

- the pollutant(s) of concern;
- the likely cause of the pollution;
- possible health effects (with emphasis upon acute effects);
- advice on what preventative measures members of the public (including sensitive individuals) should take to reduce their risk of suffering adverse health effects; and,
- advice on what action members of the public should take to reduce their contribution to the pollution episode.

Air Pollution vs Air Quality

Para 3.6 of the consultation paper states that "The Government has considered whether the term "pollution" rather than "quality" might be better understood. The document then goes on to justify the use of the term air "quality" by reference to the fact that this is the term used in UK and European legislation. Surely the relevant test should be which term is more easily understood by the general public, not simply which is used in official documents? This issue should therefore be resolved through objective research rather than treated as a matter of opinion.

Towards an Effects-Based Air "Pollution" Banding System

Subject to the above, the Society considers that there would appear to be a strong case for using the term air "pollution" as the basis for an effects-based banding system (as outlined above). Both our own experience of dealing with enquiries and providing information to the public, and that of many of our local authority members, suggests many members of the public do not understand the concept of air "quality" and they themselves think in terms of air "pollution". For a three threshold system, a suitable set of banding descriptors might comprise:

- **"LOW"** if all pollutants at or below the "standard" threshold;
- **"UNSATISFACTORY"** if one or more pollutant is above the "standard" threshold but below the "information" threshold;
- **"HIGH"** if one or more pollutant is above the "information" threshold but below the "alert" threshold;

- **“VERY HIGH”** or **“HAZARDOUS”** if one or more pollutant is above the “alert” threshold.

As noted above, these descriptors would be supplemented by summary information on: the pollutant(s) of concern; its probable causes; health effects; preventative measures; and action individuals could take to ameliorate the problem. Further work would be required to develop appropriate standardised wording for this summary information. However, an air pollution bulletin during an extremely bad wintertime smog episode might read something along the lines of:

“AIR POLLUTION BULLETIN (DATE: TIME until DATE: TIME): Air Pollution **VERY HIGH** for **NITROGEN DIOXIDE** and **PARTICLES**. Probable cause traffic fumes combining with adverse weather conditions. Those suffering from heart or lung disease may experience a worsening of their symptoms and should if necessary consult their doctor. Most healthy people should not experience adverse effects. Avoid car journeys and use public transport where possible, particularly during the morning peak period.”

An effects-based air pollution banding system of this type would overcome a number of the Society’s concerns relating to the proposals. In particular, it would support the objectives of the National Air Quality Strategy and would provide a more appropriate framework for dealing with fine particles. Such an approach would also: be considerably more user-friendly; allow members of the public to make informed choices on the basis of the information given; and, provide a coherent uniform structure for air pollution bulletins/forecasts.

Information Dissemination

The consultation document has little to say concerning the dissemination of AQ information to the public. In its response to the public consultation draft of the UK National Air Quality Strategy the NSCA called for consideration to be given to:

“whether there is a case for Government intervention with the mass media in order to ensure that air quality information is effectively communicated to the public at large. For example, radio and television channels, or at least those operated by the BBC, could be required to broadcast air quality information and advice on pollution episodes as part of their weather forecasts.”

Such intervention could take the form of non-statutory guidance or a voluntary agreement with relevant sectors of the media. The Society considers that this issue should be addressed within the consultation document.

Many local authorities operate local air quality information services. Indeed, a number of them have shown

considerable imagination in developing innovative methods of communicating AQ information to the public. The DOE should identify examples of best practice in the provision of such services and issue guidance.

Recommendations

The NSCA therefore recommends that the Government should:

- provide a clear statement of the aims of a future AQ public information system for the UK.
- give consideration to the development of an effects-based air pollution banding system, as outlined above.
- commission independent research to evaluate the effectiveness of the various AQ public information systems proposed.

FUTURE EUROPEAN NOISE POLICY

The March/April 1997 issue of *Clean Air* carried an article by Colin Grimwood and Matthew Ling of the Building Research Establishment which summarised the European Commission Green Paper on Future Noise Policy and looked at the impact it could have on UK noise abatement measures. Below are NSCA’s comments on the Green Paper which were submitted to the Commission in March.

Overview

The National Society for Clean Air welcomes publication of the Commission’s Green Paper “Future Noise Policy”, as a significant step towards the development of a new framework for dealing with environmental noise pollution at a European level. The issue of environmental noise pollution has historically received a much lower profile than have those of water and air pollution. This may be partly explained by the localised and transient nature of many noise problems and generally poor understanding of the relationship between noise pollution, health and welfare. The issues of recreational and neighbour noise are not considered within the Green Paper.

The most important message from the Green Paper is that environmental noise pollution is to be given greater prominence on the European Union agenda. In general this is a development which should be welcomed. Although national and cultural factors are important in the assessment and regulation of noise pollution, there is clearly an appropriate role for the European Union in harmonising aspects of noise policy: establishing common product standards, promoting research and the exchange of information.

Greater attention needs to be given to the loss of environmental amenity and possible ecosystem impacts of noise. In this context further thought is also required as to what positive role the EU might play in helping to safeguard Europe’s remaining ‘tranquil areas’ for future generations.

The NSCA is, however, concerned by certain aspects of the Commission's proposals, particularly those relating to the use of noise mapping and the setting of minimum target values for noise. These are discussed in detail below.

Specific Comments

A Framework for Noise Exposure Assessment

An EC Noise Exposure Index: The NSCA recognises that the establishment of a common EU noise exposure index, to ensure that data on environmental noise exposure are made available in the same noise units, is an important prerequisite to future European action. Such harmonisation is strongly supported by the NSCA. However, further consultation is required on the technical detail of the Commission's proposal.

Noise Mapping: The NSCA recognises that the techniques of noise mapping have considerable potential within certain prescribed fields. For example, to make generalised information available to the public and as an aid to planning. However, the methodology of noise mapping clearly requires further development if its uses are to be extended. Mandatory noise mapping may prove expensive and of limited use unless carefully targeted. The Commission should therefore carefully reconsider and clarify this aspect of its proposals.

Target Values: The Green Paper raises the possibility of establishing a limited number of European minimum target values for noise, together with an obligation on Member States to take action if these target values were to be exceeded. The NSCA is concerned that the establishment of such target values may prove premature and extremely controversial unless firmly based upon objective evidence of adverse health and ecosystem effects.

Action on Different Sources

Road Traffic Noise: Traffic noise is a significant problem. The United Kingdom has a poor record on the use of low noise road surfaces and noise barriers, in comparison to many other Member States. The NSCA therefore welcomes the Commission's proposals for further action on road traffic noise.

Railway Noise: Rail has considerable environmental advantages over other transport modes. However, further action is clearly required on the issue of rail noise, if long-term public support for rail is to be maintained. The NSCA therefore supports the Commission's Green Paper proposals to: set noise nuisance limits for the trans-European high speed network; negotiate reductions in noise from freight wagons; and, to promote research.

Aircraft Noise: Following the failure of the International Civil Aviation Council Committee on Aviation Environmental Protection to agree a reduction in certificated noise levels for new aircraft, there is clearly a need for a new international agreement on stricter emission

standards for aircraft noise. The NSCA therefore welcomes the Commission's proposal to push for such an agreement. In this context, the NSCA also believes that it is important that the definition of 'night-time' should not be further eroded.

The Green Paper does not discuss the issue of financial penalties for poor track keeping, which can cause excessive noise when aircraft deviate from Noise Preferential Routes. Australia has recently introduced legislation to allow such fines. The Commission should consider the contribution such fines could make as part of its forthcoming proposals on airport charges in general.

Outdoor Machinery: NSCA welcomes the proposal for a Directive later this year, which would include noise limit values for some equipment and introduction of noise labelling for a wide range of outdoor equipment, from lawn mowers to generators and bulldozers. The introduction of noise labelling has an important role to play in the creation of a market in low noise products.

Contributions to Noise Abatement Action in Member States: The NSCA welcomes the European Commission's support for the promotion of exchanges of expertise and information on noise abatement between Member States and local authorities. Noise problems are an area where there is a great deal to learn from the exchange of information and ideas, and from examples of best practice. Such measures may prove extremely cost effective in the longer-term. The NSCA believes that the Commission should take a more proactive role in promoting research into the relationship between noise and human health, as well as the wider effects of noise on sensitive ecosystems.

Conclusion

Overall NSCA welcomes the greater prominence to be given to environmental noise pollution and believes that the Green Paper provides a sound basis for future action. However, NSCA believes that the Commission's proposals regarding the use of noise mapping and the setting of minimum target values should be reconsidered. Further consideration should also be given to what role the EU might play in safeguarding Europe's remaining 'tranquil areas', and greater priority should be attached to research into the health and ecosystem impacts of noise.

NATIONAL NOISE AWARENESS DAY

Preparations for National Noise Awareness Day (Wednesday, 23 July) are well underway. Information packs have been sent out to all local authorities, national bodies concerned with noise and youth organisations. Feedback so far has been very positive - 40 local authorities have confirmed that they will be taking part, and youth organisations including the Guides and London Union of Youth Clubs have also expressed an interest. NAD has already received some coverage in the specialist press.

If you have not yet received a NAD Information Pack and would like to know more and take part on the day, contact Mary Stevens at NSCA: Tel: 01273 326313; Fax: 01273 735802; Email: info@nsca.org.uk.

NSCA WASTE MANAGEMENT INFORMATION INITIATIVE

As at 5 March ENTRUST, the regulator of environmental bodies under the Landfill Regulations, had enrolled 186 environmental bodies; this entitles them to receive landfill operators' contributions for spending on approved environmental projects. So far ENTRUST has approved over a 100 projects put forward by environmental bodies.

NSCA has now enrolled with ENTRUST (enrolment no. 21062) and is seeking approval and funds for a project which aims to inform public thinking, local practice and national policy on waste management.

The overall objectives of NSCA's Waste Management Information Initiative are

- to produce a new range of public information material on the issues involved in collecting, treating and disposing of waste and to identify and pursue appropriate channels of communication.
- to provide guidance to local authorities on waste management practices likely to lead to sustainable local waste strategies.
- to provide a forum for promoting consensus among all stakeholders in the waste management chain in identifying the Best Practicable Environmental Option for waste management and resource use.

Initial Areas of Activity

1. Hazardous Household Waste

Rationale: HHW is potentially harmful, can become concentrated in the waste stream, can contaminate recycling and composting, and poses problems for landfill and incinerator operators. Public understanding of what constitutes HHW is poor. Likely to become an important issue at European level.

Target audience: General public.

Approach: Identify materials in waste which are potentially harmful or which may disrupt sustainable waste management practices. Describe safe disposal options, promote less harmful alternative products.

- Output:*
- Wall charts for schools
 - Checklists for households
 - Non-technical booklet explaining the issues
 - Competition for new, less harmful products

2. Waste Minimisation

Rationale: Experience in waste minimisation gained in one type of organisation (e.g. a garage or restaurant) could usefully be shared with other businesses in the same sector.

Experience is less likely to be transferable between different business sectors.

Target audience: Commercial sector, industry, schools and colleges, institutions (e.g. nursing homes) and the general public.

Approach: Identify sectors where a common approach to waste minimisation could be adopted. Research case studies and produce sector-specific good practice guides.

- Output:*
- Detailed information sheets on different categories of business.
 - Articles in trade publications for each sector.

3. Organic Waste Treatment Methods

Rationale: Diverting organic wastes is a feature of the latest Landfill Directive, and is recommended in the strategy document "Making Waste Work" (1995). The public have an instinctive preference for composting and anaerobic digestion. Detailed work is needed to compare the environmental benefits of different routes for organic wastes.

Target Audience: Local authorities, national government, landfill operators, general public.

Approach: Work with industry and academics to collate information and identify future research needs.

- Output:*
- Desk study of environmental impacts.
 - Seminar to publicise findings and open debate.
 - Printed report.

4. Other Areas of Concern

A number of other possible areas of activity are under consideration:

- systematic approach to developing BPEO for local waste plans;
- options for specific bulk wastes: PFA, gypsum, etc.

NSCA is currently approaching a number of companies who may be considering making contributions to environmental bodies under the Landfill Tax provisions. Such support would be acknowledged on any material produced.

For further information, contact Tim Brown at NSCA in Brighton.

TRAFFIC REDUCTION TARGETS

Against all the odds, the dying days of the last Parliament saw the passage into law of the *Road Traffic Reduction Act*. However, the price of Government cooperation, essential to the passage of the controversial Private Members Bill, was a heavy one: all mention of national traffic reduction targets was dropped from the legislation.

The passage of the *Road Traffic Reduction Act* is undoubtedly a significant victory, even in its watered down form. It represents a watershed for the UK transport policy

agenda. From the NSCA's perspective, the Act should also provide an important management tool for local authorities to complement the development of local air quality strategies and action plans.

However, the establishment of national traffic reduction targets remains a pre-requisite to the development of a sustainable transport system for the UK as a whole. Furthermore, with harmful emissions from road transport forecast to increase significantly in the longer-term, such targets will be essential to achieving the objectives of the National Air Quality Strategy and safeguarding public health.

The NSCA is therefore supporting a renewed campaign by Friends of the Earth, the Green Party and Plaid Cymru, the Act's original backers, for national traffic reduction targets. A new Bill - *the Road Traffic Reduction (National Targets) Bill 1997* - has already been drafted. Cynog Dafis MP (Plaid Cymru), who came fifth in the Private Members' ballot, has agreed to sponsor the Bill. The new Labour administration has previously committed itself in principle to the idea of national transport targets and accepted that the "current state of affairs is unsustainable". The pressure will now be on the new Government to show its hand.

For further information on the *Road Traffic Reduction (National Targets) Bill 1997*, please contact Ron Bailey, Martyn Williams or Camilla Freeman on 0171-4901555 ext. 1414.

SOLUTIONS FOR CLEAN AIR

On the 23 April 1997 the Swedish Trade Council and City of Göteborg, in association with the NSCA and Financial Times Automotive Publishing, hosted a one day seminar to illustrate the organisational and technological approaches to improving air quality in Sweden and consider their application to the UK. Held at the National Exhibition Centre, Birmingham, the event attracted an influential audience from business and local government.

Speakers from the Swedish National Roads Administration, the Traffic & Public Transport Authority, the Environmental Protection Office and the City of Göteborg provided an overview of air quality management in Sweden's second city. Contributions from the commercial sector included papers on: "The bus and truck of today and the future" Volvo Buses UK; "The outlook for exhaust treatment systems" Johnson Matthey; "Modern fuels for cleaner air" Aspen Petroleum; "Cleaner air through attractive public transport" Thoreb; and, "Sustainable traffic modelling in urban areas" Linné Trafiksystem. A number of key themes emerged from the day's presentations. These included the importance of:

- Integrating environmental and transport policy considerations - from R&D right through to service provision.
- Forging active partnerships between local and central government, industry and academia.
- Driving-up environmental performance through setting high standards and entry criteria for public transport providers.
- A willingness to use both fiscal incentives and regulation to create a market for cleaner technologies.
- Above all, a belief that achieving high environmental standards will not only lead to improvements in the public's 'quality of life', but that it will also confer a competitive advantage upon industry.

For further details contact, the Swedish Trade Council, tel: 0171 935 4130.



Volvo's Environmental Concept Bus in Götebo

REPORTS

Local Authority Progress in Air Quality Management

Tim Bartlett, Adur DC; Tim Brown, NSCA
Tom McDonald, Glasgow CC; Frank Price, Sheffield CC

The 1997 NSCA Spring Workshop provided an opportunity for local authority air quality managers to look ahead to their new responsibilities under the Environment Act 1995. The Workshop was over-subscribed, indicating a high level of interest and suggesting a continuing need for such training events. Workshop sessions allowed current experience and potential concerns to be shared. Discussion centred on the following questions:

- 1. How well equipped are local authorities to undertake first stage review and assessment (R&A) of local air quality?*
- 2. How effective are air quality managers (usually environmental health officers) at engaging other professions in air quality matters?*
- 3. Is there a good basis for cross-border collaboration between neighbouring authorities?*
- 4. What are the practical constraints to action in the short and medium term?*

1. Ready for Action?

Many local authorities are already making progress with local air quality management (LAQM), with large metropolitan areas and cities - those most likely to be declaring management areas - generally further advanced than smaller towns and rural areas. Officers involved in "first phase" trials indicated that work was now progressing well and felt it important that their research was pulled together effectively so that the lessons can be communicated widely. Many authorities are treating their first steps in review and assessment (R&A) not as a review of air quality, but as a collation and review of the data that will be required for stage two and three R&A. The draft guidance on R&A is sketchy and the outcome of the first phase trials of the R&A guidance is keenly awaited.

Most authorities have access to large quantities of data and are capable of undertaking first stage work, but significant time will be required to extract and collate existing information. Some groups are already in the process of compiling emissions inventories. Problems have arisen in obtaining information; emissions data from authorised processes is often not available on the public register, or is in the wrong form. Data for vehicle fleets is also difficult to obtain in a useable form. In relation to data for commercial buildings, the Inland Revenue has used the Data Protection Act to prevent the Berkshire AQM group obtaining information from Business Rates, while in Sussex privatisation of the gas market has resulted in gas suppliers citing commercial confidentiality when asked to provide information on gas use. The Environmental Information Regulations could possibly be used to obtain information from some sources.

Because of perceived fears about the inaccuracies in inventories and AQ models, some authorities are planning to use low-cost monitoring techniques (e.g. diffusion tubes) in order to assess air quality. In many areas ambient AQ monitoring data is now widespread and comprehensive, but may well not be fully analysed and interpreted. A range of useful information is available from the national air quality archive, although care is required when using such data. It is clear that there is a need for much more data from roadside locations.

2. Colleagues on Board?

After a slow start, internal links to planners, transport managers, engineers, etc, remain patchy. Unifying processes such as structure plans and transport package bids have acted as a useful way of forging links. Air quality must be brought into the remit of both Local Plans and Structure Plans. Further guidance would be appreciated on this, as would positive guidance aimed specifically at planners on the issues raised for them by LAQM.

Interdepartmental liaison is often catalysed by a particular issue, or initiated by individual officers acting as air quality "champions". Usually the initiative has come from environmental health interests, but some planners and environmental policy officers have been instrumental in establishing working groups.

Local air quality strategies require support from the public and business community, and effective consultation procedures need to be developed. Local Agenda 21 and resultant action plans are useful models for engaging the wider public in action and debate, but further work is needed to develop good practice and guide the integration of AQ with the wider LA21 process.

3. Co-operation with Neighbours?

External links to neighbouring authorities are relatively well established through chief officer groups, pollution advisory groups, NSCA Divisions etc. The degree of collaboration is dependent upon the priority given to AQ by senior officers and members in each authority. Collaborative groups tend to be based around large conurbations or counties. Some have made considerable progress towards emissions inventories, review and assessment, etc. Others are awaiting guidance before progressing.

Concerns were expressed about mechanisms for agreeing responsibility for action in two-tier authority areas. County councils may not prioritise requests for information, and if Air Quality Management Areas are declared, counties must assist in dealing with transportation issues.

Economies of scale are achievable through regional cooperation, particularly in relation to AQ modelling where regional data and effects are important. Appropriate training must be made available to ensure the effective use of models.

4. Practical Problems?

Many officers expressed a feeling of being relatively helpless to influence local air quality in the face of regional or national developments. Current consultation procedures offer inadequate influence over new highways and other developments that affect AQ. Local action to manage traffic on existing major trunk roads and motorways will also need to be backed by national measures to limit overall demand. There was therefore a need for a feedback mechanism for individual authorities or regional groupings to influence national policy, in order to achieve a fair and effective balance between local and national management measures. The NSCA Air Quality Information Exchange Network and the local authority associations offer two feedback routes; the proposed national Air Quality Forum may also fulfil a role here.

There is a danger that AQ standards and objectives will become "planning ceilings" in areas of good air quality. This may have the effect of relocating polluting activities to rural areas and a levelling of air quality across the country. Guidance on the acceptable degree of AQ "headroom" could be helpful.

Human resources and revenue/capital financing costs are a major issue for all authorities. LAQM is competing with other priority issues at a time when resources in many cases are diminishing. Many rural authorities have small environmental health teams already stretched on noise and food safety enforcement, with relatively little expertise in AQ issues. Larger urban authorities are likely to progress to second and third stages of R&A and on to AQ Management Areas. This will require significant funding for time, equipment and training.

Considerable staff time is often necessary to develop budget bids to secure additional resources. A certain amount of criticism was levelled at the current supplementary credit approval scheme; a stepwise release of funds linked to the attainment of identifiable thresholds in the LAQM process would be preferable.

5. Conclusions

Most authorities are already preparing for their forthcoming AQ responsibilities, but the picture remains patchy. Liaison arrangements are developing slowly.

In the absence of firm guidance on R&A the likely need for resources and training is difficult to judge. Whilst it is sensible to await the outcome of first phase work before providing detailed guidance, it would be helpful to have some indication of the *scope* of the guidance so that other bodies can begin to plan their role in training and information provision. It does seem clear that there will be a local requirement for skills both at a technical level, and at a strategic policy level.

Work by first phase authorities and others in the AQ frontline has thrown up a number of practical issues which need to be resolved. Accessibility of data for emissions inventories is a key concern. First phase work is progressing well, and there is a need to ensure that valuable experience is transmitted to all other authorities.

Many authorities are questioning whether the powers and resources currently available will enable them to fully meet their new responsibilities for LAQM. They need to be reassured on two counts. Firstly, that appropriate levels of funding, training and guidance will be provided. Secondly, that structures will be developed which allow local authority concerns about LAQM to influence regional and national policies.

Indoor Air Quality Assessment Techniques

Dr. Jon Pullen
Stanger Science and Environment

This paper concentrates on the role of monitoring chemical and physical pollutants as an indoor air quality assessment technique. Particular attention is paid to using monitoring within the framework of a monitoring strategy to meet the objectives of the investigation. It is based on Dr. Pullen's paper to NSCA's training seminar on Indoor Air Pollution held in February 1997.

Introduction

Complaints about the indoor environment in non-industrial buildings are often due not to one factor alone, but to a combination of many chemical, physical, biological and psychological factors. These include poor air quality (airborne and surface contamination, temperature, humidity and air movement), malingerling, social problems, high or low lighting levels, VDU operation, tinted glass, noise and vibration, insulation from the outside and perception of lack of personal control over conditions. The precise mix can vary from one building to another, adding to the difficulty of identifying the underlying cause. Because factors other than poor air quality are often involved, it is important to try and identify the type of problem one is dealing with before thought is given to sampling for air pollutants. Questionnaires and interviews with statistical evaluation are commonly used in screening surveys^{1,2} to identify the existence of a genuine problem and indicate the possible underlying causes. Other approaches such as computer modelling can sometimes be used as a cost-effective alternative to monitoring, particularly for estimating exposures of large populations and predicting the impact of building-design alterations or policy changes.

Monitoring as an Assessment Technique

If poor air quality is identified as the likely cause of the problem, monitoring can be a powerful indoor air quality assessment technique. There is a wide range of possible objectives (see Box 1) and the exact aim of the proposed study should be clearly defined at this stage to permit the design of a suitable monitoring strategy: even the most sophisticated monitoring method can provide unsuitable data unless one specifies what, where, and when to sample, how long to sample for, how many samples to take and by what method³.

What do we Measure?

Indoor air quality is a broad term, but is usually considered to include:

- Chemical pollutants - inorganic and organic vapours, odours, environmental tobacco smoke (ETS), radon;
- Physical pollutants - particulate matter/dust, pollen, asbestos;

- Biological factors - allergens, dust mites, moulds, fungi, bacteria (e.g. Legionnaires' Disease);
- Physical parameters - air temperature, air velocity, relative humidity.

Box 1: Common Aims of Indoor Air Quality Monitoring Studies

- Investigation of health effects, discomfort (e.g. itchy eyes, dry throat), Sick Building Syndrome.
- Health reassurance monitoring (e.g. CO monitoring near combustion appliances, asbestos fibres at sub-Clearance Limit concentrations).
- Comparison with recognised air quality criteria.
- Estimation of individuals' cumulative exposures to indoor and outdoor sources.
- Odour investigations.
- Public health/epidemiological studies.
- Verification of building performance *cf* specifications (e.g. ventilation, clean room studies).
- Materials emissions studies.

In the case of a chemical or physical pollutant, the indoor concentration is a function of its outdoor concentration and rate of infiltration into the building, the rate of its emission inside the building, the rate of removing by indoor surfaces (sinks), the rate at which the pollutant is produced or removed by chemical reactions in the indoor air, and the air exchange rate of the room. Whilst some pollutants (e.g. tobacco smoke, body odours) are emitted entirely from within the building, others show indoor levels strongly dependent upon the outdoor ambient conditions. In such cases, a check should first be made to see if complaints coincide with known episodes of poor ambient air quality, or emissions from any nearby external pollution sources.

In deciding what should be measured, the choice is between: all or most of the pollutants/parameters expected to be of significance; a single (or small number of) substance(s) to act as a guide to exposure and control; or a surrogate material as a guide to exposure. The decision often rests on the practicality and expense of monitoring for the different pollutants, and whether accepted air quality criteria are available. If it is strongly suspected that a particular indoor or outdoor emission source is the cause of the poor indoor air quality, then it is possible to target pollutants strongly associated with it (Table 1). For

example, nitrogen oxides from cookers; ozone from photocopiers; airborne asbestos fibres from DIY activities; VOCs from resins, solvents, adhesives or paints; formaldehyde from resin-bonded wood or fabrics. A CEN working group⁴ is considering pollutants emitted by building materials. There are, however, many instances where the pollutant must be identified as well as quantified, e.g. when the source is not clear or when nuisance odours are investigated. The organic vapours are by far the largest group of pollutants, several hundred having been identified in the indoor environment, and identification of these is usually carried out by gas chromatography-mass spectrometry (GC-MS).

One may still need to consider what precise form of the pollutant should be measured:

- Which phase to measure - contaminants are usually in either the gaseous phase or solid (particulate) phase. However, some pollutants, e.g. PAHs, are partitioned between both phases.
- Total or speciated measurements - for certain pollutants it is common to express the concentration as the sum total of the individual species present, e.g. total organic volatile compounds (TVOC) concentrations have been used to screen for sick buildings^{5,6}. However, the effects of mixtures can vary and some members of a group of pollutants may be of special importance, requiring specific determination, e.g. speciated measurements of benzene, toluene and xylenes.
- Further chemical and physical characterisation - for it may be desirable to measure different fractions (e.g. as TSP, PM₁₀ or PM_{2.5}), or to carry out further physical or chemical characterisation (e.g. by SEM/EDAX) to identify the source of the pollutant.

When to Sample, How Long to Sample for, How Many Samples?

Continuous or Intermittent Sampling

Pollutants present indoors continuously (i.e. over days to months) may be at a constant concentration or levels may fluctuate (Figure 1). Other pollutants may be present only occasionally, but even over these short periods (typically minutes to hours at a time) concentrations may be constant or variable. It is this short-medium term variability in pollutant concentrations that determines whether it is necessary to sample continuously or whether it is possible to sample intermittently. Continuous sampling is required if pollutant levels vary so frequently and significantly that intermittent sampling periods are not likely to be representative of the study period as a whole. For example, dust adsorbed onto floors and walls etc. can be subsequently resuspended by the disturbance caused by occupants⁷, leading to considerable short-to-medium term variations in airborne levels of fine particulates (thought to be important in Sick Building Syndrome).

Figure 1: Typical Diurnal Changes in Carbon Dioxide Concentration in an Inadequately Ventilated Library

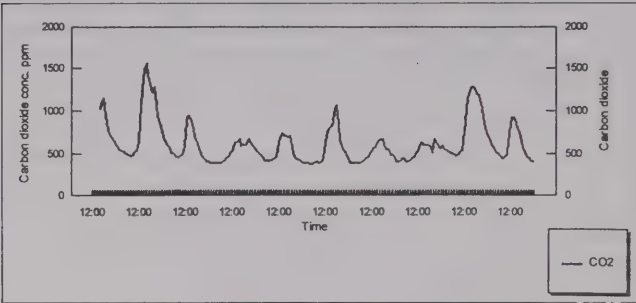
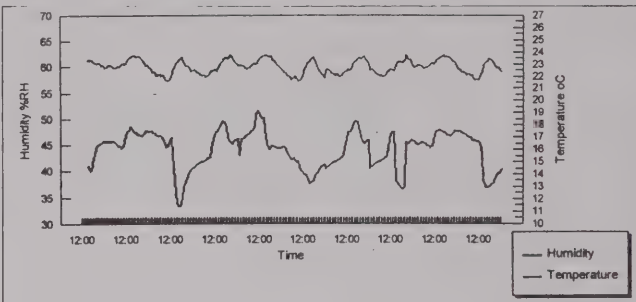


Figure 2: Diurnal Changes in Temperature and Relative Humidity in an Inadequately Ventilated Library



In other instances intermittent sampling may be sufficient, but one must consider:

- Number of samples/frequency of sampling - must be frequent enough to adequately characterise the short-to-medium term variability in pollutant concentrations;
- How long to sample for - take into account the averaging time of the relevant air quality criterion, which usually determines the maximum duration of each sample; and measurement method performance limitations (e.g. sample saturation, sample breakthrough);
- When to sample - significant changes in concentration with time are often observed indoors, with changes in ventilation conditions, and whether or not sampling is carried out during activities such as smoking, cooking and cleaning having an important influence⁸. For the study of personal exposure levels, the time of occupancy in relation to the sampling period needs to be considered.

The Averaging Period

To date, air quality criteria have been established primarily for outdoor ambient air and workplace environments. In the absence of other criteria these are often used as guideline values for indoor air although caution should be exercised since the health effects of long-term exposures to low concentrations have not been well established in all cases. The averaging period will usually be specified along with the limit concentration and can range widely, from 15 minutes to 1 year (see Box 2). When the averaging period has not already been fixed, the decision will need to be based on how the pollutant concentration is expected to

vary with time in the indoor environment, the characteristics of the monitoring methods available, and the importance of short-term peaks of the pollutant: for example sulphur dioxide has acute health effects and is generally measured over short averaging periods, whereas lead has a long-term cumulative effect making short-term peaks much less important. Box 3 gives some suggested averaging times for different applications.

The required averaging period may limit the choice of measuring techniques, as some methods may only be capable of operating with a finite range of sampling averaging times. This is particularly true for non-continuous methods having an associated analytical end-method stage, for which a sufficient mass of pollutant must be sampled to achieve the required lower detection limit.

Duration of the Sampling Programme

The duration of the sampling programme must be sufficient to adequately characterise the variability in pollutant concentration over the medium-to-long term. This may be significantly affected by diurnal cycles in meteorological

conditions and emission patterns, weekday/weekend differences, and seasonal variations. Most indoor air quality assessments have a sampling duration of a week or more and, in general, long-standing programmes are required when comparisons are being made with long-term air quality criteria. When infiltration of outdoor pollutants is an important factor, extended monitoring may be required because of the especially strong influence of meteorological conditions, which can cause some short-term pollutant episodes to occur on only a few days in each year. For intermittent sampling conducted daily or weekly, it has been suggested⁹ that sampling for one month or three months, respectively, will provide representative average concentrations so long as seasonal differences are not significant.

Where to Sample

Monitoring surveys can be carried out on very different scales, ranging from an assessment of indoor quality within one specific building, to a study of a range of conditions and building types. There are two issues relevant to

Box 2: Air Quality Criteria for Common Indoor Air Pollutants

Pollutant	Concentration	Measured as	Reference
Carbon dioxide	1000 ppm	Peak	ASHRAE
Carbon monoxide	10 ppm	running 8-hour mean	NAQS, WHO
	25 ppm	1-hour mean	WHO
	50 ppm	30-minute mean	WHO
	90 ppm	15-minute mean	WHO
Nitrogen dioxide	105 ppb	1-hour mean	NAQS, WHO
	20 ppb	annual mean	NAQS
Ozone	50 ppb	running 8-hour mean	NAQS
Sulphur dioxide	100 ppb	15-minute mean	NAQS
	40 ppb	24-hour average	WHO
	17 ppb	annual average	WHO
Particulates PM ₁₀	50 µg/m ³	running 24-hour mean	NAQS
Formaldehyde	100 µg/m ³	30-minute mean	WHO
Benzene	5 ppb	running annual mean	NAQS
Di-isocyanates	0.7 µg/m ³	15-minute mean	STEL/100

Box 3: Suggested Averaging Times for Different Studies

Averaging period	Type of Survey
≤ 15 min	Odours; acute respiratory effects; comparison with certain air quality criteria.
1 h	Comparison with certain air quality criteria; diurnal changes.
8 h	Comparison with certain air quality criteria, including time-weighted average OEL/40 or OEL/100.
24 h	Comparison with certain air quality criteria; chronic health effects; seasonal effects.
1 month	Seasonal and annual variations; long-term changes.
1 year	Comparison with certain air quality criteria; long term changes

sampling positions: the location of sampling positions relative to one another; and the suitability of any one sampling position.

Sampling Position Requirements

As a general principle the samplers should be considered as “receptors” for the parameters to be measured. When assessing exposures of individuals this is achieved by conducting personal sampling of air from within the breathing zone of the subject. For characterising general ambient air quality within a building, fixed-point (static) sampling is usual, and the following requirements usually apply:

- Sampling height - the sample air inlet should generally be at head height (breathing zone);
- Interfering sources - ensure the sampling location is not immediately adjacent to a source of interference (e.g. a cleaner’s cupboard) unless this is a specific objective;
- Accessibility - sampling sites must be accessible for any servicing, calibration or data collection, but should be in a location where the risks of vandalism or accidental damage are minimised;
- Services - suitable services should be nearby, e.g. electrical supply for sampling equipment, telephone line for data retrieval.

For certain specific aims and objectives some of the criteria will be different: for studying levels of NO_x from indoor combustion appliances, buildings should be greater than about 20 m from busy roads to avoid interference from vehicular emissions. Similarly, a study of indoor exposure to benzene would need to take account of distance of the selected dwelling from the roadside. With some measurement methods, certain requirements increase or decrease in importance: diffusive sampling requires virtually no services, but it is most important that diffusion tubes are placed away from walls to allow good air movement around the tube. Whenever there is to be more than one sampling position, or monitoring in more than one building, then the requirements should apply to all the sampling positions to allow valid comparison between data from different locations.

Guidelines on Locating Sampling Positions

Because monitoring studies can have different objectives, there is no universal set of rules for locating sampling positions. Where there is a perceived air quality problem in one part of a building and not another, it is desirable to monitor at control positions for comparative purposes. Only for some specialised forms of indoor air quality monitoring (e.g. clean room monitoring or asbestos monitoring) are specific guidelines laid down on the number and location of sampling points within the room. For monitoring general indoor air quality the most common sampling positions are at head height in the centre of a room, or at head height

close to a source⁸. It is assumed that the concentration measured by the sampling equipment is also a good estimate of the mean concentration in the surrounding area. The size of this surrounding area, and hence the number of monitoring sites required to adequately characterise the survey area, is dependent on the spatial variability of the pollutant, which in turn is strongly influenced by the location of sources and variations in ventilation efficiency within the room. This may be assessed subjectively or by a pilot survey. Ideally replicate sampling should be carried out, at least at some locations so that some idea of the measurement uncertainty is obtained. More samples give better confidence levels and a rule of thumb used for workplace strategies¹⁰ is that at least three samples should be taken before any statement of results is made and additional samples should be taken if the results exceed a 25% spread.

How to Measure

Choice of Monitoring Method

A broad classification can be made into direct-reading (usually automatic) methods and indirect (usually manual) methods. Direct measurement techniques are those where the air is sampled and the quantification stage of the pollutant analysis is performed in-situ virtually instantaneously. Most direct-reading analysers provide a continuous readout of the pollutant concentration or have a relatively short sample time-average period. Indirect measurement techniques are those where the air is sampled for a fixed time and the pollutant is captured, by for example evacuated flask, cryogenic trapping, absorption in a liquid or adsorption onto a solid resin. The analysis is then carried out on the pollutant in this form or after further pre-treatment of the sample. Indirect methods give measurements averaged over the individual sampling times, which may vary from a few minutes to several weeks.

Box 4: Common Particulate Measurement Methods

<i>Suspended Particulate Matter</i>	<i>Deposited Particles (Surface Contamination)</i>
TEOM	Dust slides/soiling meter
Light-scattering systems	Sticky plates/tape
Filter paper sampling trains	
β-gauge instruments	
Impingers	

Box 5: Common Direct-Reading Measurement Methods for Gases

	<i>CO₂</i>	<i>CO</i>	<i>SO₂</i>	<i>NO_x</i>	<i>O₃</i>	<i>Organics</i>
NDIR	•	•				
NDUV			•			
UV fluorescence			•			
Chemiluminescence				•		
Flame photometric			•			
FID, PID						•
FTIR						•
UV absorption					•	

Box 6: Common Indirect Sampling Methods for Gases

Absorption Sampling	Adsorption Sampling	Cryogenic Sampling	Grab Sampling	Passive Sampling
Bubblers	Sorbent tubes	Cryogenic traps	Tedlar bags	Diffusion tubes
	Coated filters		Evacuated flasks	
	Denuder tubes		Evacuated canisters	

For a given pollutant, there may be a number of measurement methods available, and selection of a suitable method requires careful consideration of the following:

- Method performance - including limits of detection and measurement range, speed of response (must be sufficient to resolve any pollutant concentration peaks of interest), selectivity/specificity susceptibility to interferences; accuracy and precision, and reliability/unattended operation.
- Method cost - capital and running costs of different methods vary widely. Some simple inexpensive apparatus can be labour intensive when used for extended durations. Automated monitoring equipment is available for unattended operation but the capital costs are usually higher.
- Practical considerations - including method complexity; portability; size and noise (may cause annoyance in some buildings); services/facilities (e.g. electrical power).

Analysis of Results and Reporting

Presenting the Raw Data

The raw data are collected together with appropriate ancillary information necessary for the data interpretation, e.g. questionnaire results, temperature and humidity, noise, light intensity, ventilation conditions. Information on the source of pollution is obviously important: some sources, for example combustion compliances, may be operational at only certain hours of the day. Other pollutants, such as CO₂ from building occupants, may be dependent on working patterns. For indoor air quality influenced by traffic pollution from a busy road, the daily patterns of traffic flow will be important in interpreting the data. The raw data may then be presented as histograms or graphs. Time plots may help identify outlying data points and periods with missing data, and clearly show important features such as high pollution episodes or diurnal patterns.

Summarising and Interpreting Data

Simple tables and graphs can show interesting features, but may be unsuitable for reporting large amounts of raw data. In such cases it is usual to provide a statistical summary, enabling the air quality to be described by a limited number of numerical values, e.g. mean values, median values, or percentile values. Other concepts used to summarise a set of raw data are frequency distributions and measures of central tendency, e.g. standard deviation. Time series plots can be used to illustrate particularly interesting portions of

data. The air quality measurements then need to be interpreted in a way that is relevant to the aims and objectives of the study and this may involve comparisons with air quality criteria, assessment of health impact, or verification of ventilation/building specification.

Quality Control and Quality Assurance

Quality Control/Quality Assurance runs the whole way through the project, from setting initial objectives, formulating a monitoring strategy and summarising the indoor air quality, and gives credibility to and confidence in the results. QC procedures are designed to reduce measurement uncertainties (errors) to a minimum, and to allow the remaining uncertainties to be quantified. In pollution monitoring QC usually covers method selection, sampling systems, sample volume and flow rate measurements, sample storage and transit, calibration and validation, and maintenance. QA, sometimes described as the quality control of quality control, should address the monitoring protocols, quality control procedures, sample traceability and reporting. The QA system should encompass the Department of Trade and Industry's initiative on Valid Analytical Measurement (VAM) which sets out the main principles of good analytical practice, enabling analytical laboratories to demonstrate the validity of their data and facilitating mutual recognition of analytical results. The VAM principles are:

1. Analytical measurements made to satisfy an agreed requirement;
2. Analytical measurements made using methods and equipment fit for the purpose;
3. Staff making measurements should be both qualified and competent to undertake the task;
4. There should be regular independent assessment of the technical performance of the laboratory;
5. Analytical measurements made in one location should be consistent with those made elsewhere;
6. Organisations making analytical measurements should have well defined QA/QC procedures.

When all of these principles are complied with in the context of an appropriate monitoring strategy, then monitoring can be a powerful indoor air quality assessment tool.

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Table 1: Sources of Common Pollutants in Indoor Air

Infiltrating from Outdoors		Emitted Indoors		Formed by Reaction in Indoor Air	
Pollutant	Origin	Pollutant	Origin	Pollutant	Origin
NOx, CO, SO ₂	Traffic, fuel combustion	NOx, CO, SO ₂	Combustion appliances, smoking		
CO ₂	Traffic, fuel combustion, biological processes	CO ₂	Human occupants, combustion appliances, smoking		
Ozone	Action of sunlight on NOx and VOCs	Ozone	Photocopiers, laser printers, electrostatic precipitators		
Particulates	Natural processes, traffic, combustion	Particulates	Cooking, smoking, combustion appliances, furnishings		
Benzene	Vehicles, petrol stations	Benzene	Smoking, solvents		
VOCs	Industry, vehicles, petrol stations	VOCs	Building & decorating materials, furnishings, consumer products		
PAHs	Traffic, combustion	PAHs	Cooking, smoking, combustion appliances		
Aldehydes	Traffic, industry, combustion. Less significant than for indoor sources	Aldehydes	Smoking, resins, wood products, wall insulation, textiles	Aldehydes	Reaction of ozone with VOCs
Di-isocyanates	Industry	Di-isocyanates	Polyurethane foam and coatings		
Airborne fibres	Vehicles, industry	Airborne fibres	Disturbance of building materials, DIY activities		

The Long Distance Food Trade

Helen Aslin
Women's Environmental Network

The long distance food trade affects air quality at every level from the particulates pumped out by lorries transporting imported tomatoes to ozone depleting pesticides used to prevent the goods being destroyed in the hulls of ships.

The distances food travels is increasing yearly prompting growing concerns about the resulting pollution.

The Women's Environmental Network (WEN) has launched a campaign to look into the issues surrounding food transport, particularly air pollution.

Introduction

It's difficult to think beyond the supermarket but your food may have travelled half way round the world to reach your plate, resulting in tonnes of air pollution as well as having been treated with a cocktail of chemicals to keep it looking beautiful. The chain of excessive food transportation starts on the farm where the food is grown and may involve travelling on lorries, ships, planes and yet more lorries before finally being driven home from the supermarket by car.

Supermarkets justify the importation of food by saying that it's what the customer demands. What the customer doesn't see behind the shiny plastic wrappers are the true environmental and human costs which are not reflected in the price of the food.

From the Four Corners of the World

Imports have risen by nearly 30% over the last ten years¹ and the trend appears to be increasing. Food is being transported from all over the world and even food that the UK has a great tradition of producing, such as apples, could have travelled over 11,404 miles from places like New Zealand to reach the supermarket shelves.

Western companies take advantage of cheap labour and low environmental standards in the poorer regions of the world. There, the use of pesticides is often excessive and unregulated and spraying may even take place while workers are still in the fields. Pesticides can have a devastating consequence for local air quality entering the atmosphere through drift either directly from spraying or via evaporation in the days after a field has been sprayed. As little as 10% of pesticides reach their intended target², with the remainder polluting the air, soil and water endangering the health of local people and wildlife. Research suggests that airborne persistent pesticides such as organochlorines can travel hundreds of miles before they precipitate out³.

The health effects of pesticides are far reaching and affect not only our generation; they may result in severe birth defects and links are now also being established to breast and other cancers; WEN is currently researching the extent of the link.

To make matters worse, farmers striving to meet

supermarkets' demands for uniform goods grow a reduced number of plant varieties. This means that a lot of the harvest will have the same susceptibility to disease and as a result farmers will use even more pesticides to protect crops.

Food on the Move

Even goods with a UK address on the packaging may have their origins on the other side of the world. The corn in cornflakes may have been shipped nearly 7,000 miles from Argentina before being driven to Manchester for preparation and packaging. WEN created a standard shopping basket based on the government's retail index and a supermarket's top selling list; this revealed that nearly 50,000 miles had been clocked up by the jet-setting goods; however, the resulting air pollution is largely unaccounted for.

The huge growth in the use of air freight for international food transportation is also of concern. Planes are an inefficient way of transporting food, using 40 times more fuel per tonne kilometre than shipping⁴; they also release pollutants such as carbon dioxide and nitrogen oxides into the upper atmosphere. To maintain a steady supply to shops, the exotic fruits demanded by customers will be specially flown in from all corners of the world as the growing season switches from one country to another. The amount of air freight coming into the UK has risen by a third in just five years⁵ with commercial factors outweighing any consideration for the amount of air pollution that results. The environmental cost of moving food around the globe is not reflected in the price of air freight as unlike diesel, kerosene is not taxed.

Additional treatment is needed to protect food during transportation to ensure it reaches the shop in good condition; on top of the huge amounts of packaging that will eventually end up in landfill sites, fruit and vegetables are fumigated to protect them from pests. One of the substances used is the highly toxic chemical, methyl bromide - a major ozone depleting gas which is 40 times more potent than CFCs. Although industrialised countries have pledged to phase it out by the year 2010, there is still no date stated for the developing world. Fruits are often picked unripened and kept under artificial atmospheres in temperature controlled containers during transportation; for

instance, once bananas from the Windward Islands have arrived, they are then ripened under an atmosphere of ethylene, a volatile organic compound.

Even food that is produced in the UK may be subject to the chain of extensive transport. For example, pigs reared and slaughtered in Suffolk are transported just under 300 miles to North Devon for butchering and packaging; the meat then travels to supermarket distribution centres before finally travelling to shops all around Britain - some perhaps within a few miles from where the pigs started from. The pigs from Suffolk are typical of the trend of increased road freight in the UK. The distance food travels by lorry increased 29% between 1985 and 1995⁶ with a resulting increase in the amount of emissions produced. Pollutants such as nitrogen oxides and sulphur oxides can exacerbate asthma and increase susceptibility to infections; particulates from diesel engines can penetrate deep into the lungs and have been linked to cancer.

Resistance to Distance

WEN's campaign is highlighting the air pollution caused by food transport and at the same time promoting local food for local people. Cutting the distance food travels can make a significant contribution to reducing traffic related pollution which is vital if the objectives of the National Air Quality Objectives are to be met.

For more information contact the Food Transport Campaign at WEN, Tel: 0171 2473327; Fax: 0171 247 4740.

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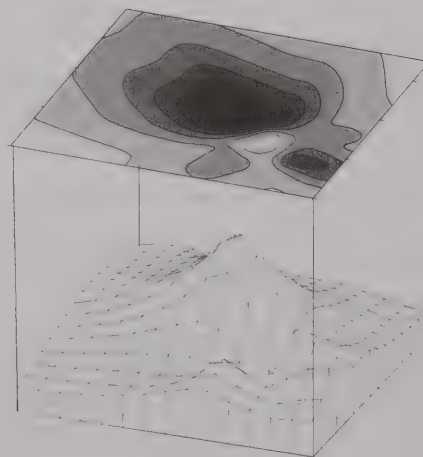
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UPDATE

DOE AND DOT MINISTERIAL RESPONSIBILITIES

The Rt. Hon. John Prescott MP, Deputy Prime Minister and Secretary of State for the Environment, Transport and the Regions has responsibility for the overall direction of the two Departments and their agencies, as well as for the regions in England and London.

The Rt. Hon. Dr. Gavin Strang MP, as Minister for Transport is also a member of the Cabinet. Glenda Jackson MP is Parliamentary Under Secretary of State (Minister for Transport in London); her responsibilities include transport in London, integrated transport policy, London Transport, railways, local transport outside London, aviation and shipping.

Michael Meacher MP becomes a Minister of State with specific responsibilities for the environment, countryside, water and for the Health and Safety Commission and Executive. He will be supported by Angela Eagle MP (Parliamentary Under Secretary of State).

Baroness Hyman will be spokesman for both the Departments of Environment and Transport in the Lords. As a Parliamentary Under Secretary of State she will also be responsible for roads and road safety.

Completing the team are: Hilary Armstrong, Minister of State, responsible for local government and housing; Richard Caborn MP, also a Minister of State, responsible for regional development and government, regeneration and planning. Nick Raynsford MP becomes a Parliamentary Under Secretary of State responsible for the construction industry and will support John Prescott on London, Hilary Armstrong on local government and housing and Richard Caborn on planning; he will also be responsible for Ordnance Survey and the Queen Elizabeth II Conference Centre.

TRANSPORT AND THE ENVIRONMENT

On 13 and 14 November up to a hundred transport and environment ministers will gather in Vienna to agree a Declaration on Sustainable Transport in the framework of the UN-ECE Regional Conference on Transport and the Environment. A number of NGOs will take part in the ministerial session.

A separate NGO conference is also to be organised, on the initiative of the Austrian Government. This event is to be hosted by the City of Vienna and prepared by the European Federation for Transport and the Environment (T&E). This conference will enable NGOs to prepare their own views on sustainable transport policies, with the aim of

directly and indirectly influencing the official process. The NGO conference will last a full day, with workshops and a plenary session in which an NGO statement, provisionally called "The Vienna Initiative", will be finalised.

T&E are currently preparing "The Vienna Initiative", drafts of which will be circulated for comment, with a final text hopefully available in September. For further details contact T&E Director Gijs Kuneman at the T&E Secretariat in Brussels: Rue de la Victoire 26, 1060 Brussels, Tel: (+32 2) 537 6639; Fax: (+32 2) 537 7394.

AIR POLLUTION FROM PETROL STATIONS

Research carried out on behalf of the Department of Environment has demonstrated that "Stage II" petrol vapour recovery systems at service stations offer better value for money than alternative methods for reducing emissions arising from vehicle refuellings; stage II also compares favourably with abatement techniques used in other industry sectors.

Further research into the costs of the proposed Stage II controls and on board vapour recovery (Chem Systems Ltd, April 1996), assesses the comparative costs of the two alternative measures for abating evaporative emissions arising from vehicle refuelling. This demonstrated Stage II to be effective at abating emissions and to cost less per tonne of VOCs abated than the alternative of fitting large carbon canisters in vehicles. Stage II also costs less per tonne of VOCs abated than the average costs of abatement measures already implemented in industry.

Monitoring carried out in connection with a *pilot study to assess benzene concentrations in the vicinity of petrol stations* (Stanger Science and Environment, September 1996) has indicated that the National Air Quality Strategy standard of 5 ppb of benzene might be exceeded at the boundary of some petrol stations. The DOE will be commissioning further research to evaluate the extent of this potential problem and to assess the available abatement options.

Copies of both these reports are available from Matthew Hall, Air and Environment Quality Division, DOE, Romney House, 43 Marsham Street, London SW1P 3PY; Tel: 0171 276 8320.

A consultation paper on the introduction of Stage II controls at certain petrol stations is expected later this year.

PACKAGING WASTE

The *Producer Responsibility Obligations (Packaging Waste) Regulations 1997* (SI 648) came into force on 6

March 1997 and apply in England, Wales and Scotland; Regulations for Northern Ireland are not expected until mid-1998. The Regulations apply to all businesses involved in the packaging chain (see box) and which handle more than 50 tonnes of packaging material and/or packaging in a year, and with an annual turnover of £5 million or more; from 1 January 2000, businesses with an annual turnover of £1 million or more will also have to comply with the Regulations; wholesalers are exempted from the Regulations until 1 January 2000.

Businesses covered by the Regulations must join a registered compliance scheme or register as an individual business with the Environment Agency or SEPA by 31 August 1997. From 1998 registration must be renewed each year by 1 April. Compliance schemes must themselves register with the Environment Agency or SEPA by 31 August 1997.

Where a business chooses to become a member of a compliance scheme, the scheme will be responsible for meeting the aggregated targets of its members and will be required to provide data demonstrating compliance to the relevant Agency - the first date for compliance with targets is 31 December 1998.

For businesses choosing to take on the obligation of meeting the recovery and recycling targets on their own, registration with the appropriate Agency is required by 31 August 1997, with data on 1996 packaging handled provided by the same date. From 1998 the date for payment of the annual fee and data provision is 1 April. Also from 1998, the business must calculate its recovery and recycling obligation for meeting by 31 December. Evidence of compliance must be submitted to the relevant Agency by 31 January of the following year.

Producer Obligations

Recovery and Recycling Targets:	
1998, 1999:	38% recovery and 7% recycling by material
2000:	43% recovery and 11% recycling by material
2001 onwards:	52% recovery (of which at least half must be recovered through recycling) and 16% recycling by material
(the targets for recovery of UK packaging waste for the above years are 32%, 40% and 50%, respectively)	
Packaging Chain: % of recovery and recycling target to be met by each:	
- raw materials manufacturers	6%
- converters	11%
- packers/fillers	36%
- seller/wholesalers	47% (wef 1.1.2000)

The DOE has produced a summary leaflet and a Users Guide (Code Pack 2), which is intended to steer businesses through the Regulations. A Ready Reckoner (Code Pack 3) to help businesses calculate the levels of packaging is also available. All are available from the DOE's Publications Despatch Centre, Blackhorse Road, London SE99 6TT; Fax: 0181 694 0099.

MONITORING INSTRUMENTS DATABASE

A computerised database of instruments used for continuous monitoring of emissions to air and water has been launched by the Environment Agency's National Centre for Regulatory Monitoring.

Called PREMIS 97 (The Process and Environmental Monitoring Instrument Selector), the package provides a wealth of information on different instruments, for example: those used in monitoring stack emissions, details include instrument manufacturer and supplier, model number, type of system, applications, parameters measured, performance data, measurement method, type approvals, output information, security details, dimensions, and ancillary equipment available.

The database was developed primarily to provide Agency warranted officers with a readily available source of information on continuous monitoring instruments and has now been made commercially available. The database builds on PLUS 6, a database for water monitoring instruments developed by WRc on behalf of the former NRA. There are three versions of PREMIS 97 available - water and wastewater, ambient air and emissions and the complete database. It will run under both DOS and Windows and costs £75 for each of the subject databases or £130 for the complete database. For further information contact WRc Information Resources, Tel: 01793 511711.

BOTHERED BY NOISE

The Department of Environment has revised its noise leaflet: "Bothered by Noise? There's No Need to Suffer" offers user-friendly information for noise sufferers. It explains what to do about noise, gives information on legislation and controls dealing with noise and shows how potential noise problems can be prevented. The final section gives details of further sources of help and information. The leaflet covers England, Scotland and Wales.

Copies of the leaflet are available free of charge from the DOE's Publications Despatch Centre, Blackhorse Road, London SE99 6TT; Fax 0181 694 0099.

DON'T FORGET

National Noise Awareness Day

Wednesday 23 July

For more details see NSCA news item, page 94

RADON - THE HOME VIDEO

This ten minute video produced by the National Radiological Board (with help from Derbyshire Dales DC, DOE and CIEH) gives straightforward answers to the questions:

- What is radon?
- How does it collect in homes?
- How does NRPB measure it?
- How can high levels be reduced?

The aim of the video is to encourage householders in high radon areas to have their homes monitored and those found with high radon levels to be remedied. The video includes interviews with representatives of central and local government; as well as a householder who has reduced the radon level in his home.

NRPB has measured radon concentrations in one-third of a million homes. Of these, 35,000 pose a high risk to their occupants - a risk that is easy to avoid. Finding further homes at risk and reducing radon levels is an important part of government strategy for improving the health of the nation.

Copies of the video, price £3.00 each, inc. VAT, postage and packing (cheque with order) can be obtained from the Press and Public Relations Office, NRPB, Chilton, Didcot, Oxon OX11 0RQ.

CLEANING UP DELHI'S AIR

In an effort to reduce traffic generated air pollution, motorists in Delhi were required to get a pollution-check certificate for their vehicles by 15 April - or face being unable to buy petrol. The ruling covers the 2.8 million cars, scooters and lorries on Delhi's roads most of which use low grade petrol, unleaded fuel having only just become available. (Source: *The Times*, 22.3.97)

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CASELLA - THE SUREST MEASURE OF A CHANGING WORLD

MEMBERS' NEWS

A good cross-section of industry and local authority members attended a one-day seminar in April, jointly organised in Newcastle by the **Northern Division** and Productivity Northeast. Speakers on the National Air Quality Strategy included Chris Megainey of DOE and Tim Brown of NSCA.

Members of the **North West Division** met in Warrington to hear about the proposed NSCA restructuring from Chairman Paul Cooney, whilst President Dame Barbara Clayton gave a presentation on the RCEP report on waste disposal and contaminated land. Question time went on so long that Paul and Barbara missed their train, but they were at least ferried to the station in the Mayor's gas-powered limousine!

The **Northern Ireland Division** AGM was hosted by **Castlereagh BC** in May. Members heard about the second Northern Ireland Air Pollution Monitoring Report from Mr. I. Gregg of **Belfast CC**, and were briefed on the implications of the UK National Air Quality Strategy by Mr. N. McMahon of the Environment and Heritage Service.

Our photo shows Roger Coey of **Cambridge CC** explaining the election results to John Gummer. Seriously, the then Secretary of State was inaugurating the Council's Internet air quality monitoring service. The Cambridge data is also used for a regional TV programme called *Anglia Air Watch* - believed to be the first programme in the UK to provide regular air quality information to help people with breathing difficulties gauge the risk posed by weather and pollutants. The Cambridge website is at www.io-ltd.co.uk/ccc.html.



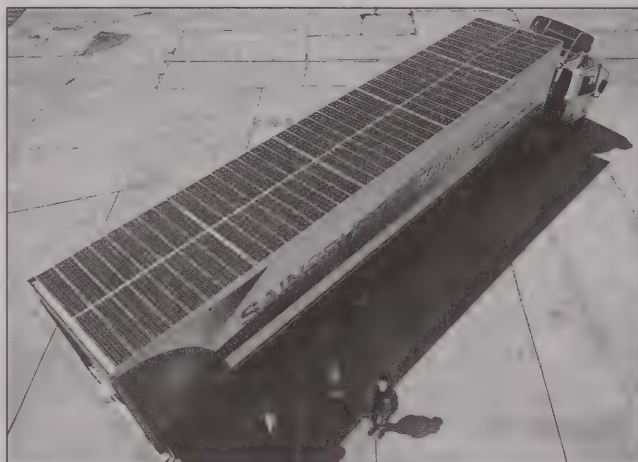
Congratulations to **Rolls Royce** for their Queen's Award in the environment category. The award is for a new lean burn process (DLE - dry low emission) for industrial

gas turbines, which achieves significant reductions in carbon monoxide and nitrous oxide.

Southwark Council has produced a final report on its LIFE-funded Air Aware Project, entitled *Curbing Air Pollution in a European Road Corridor*. Copies are available from Simon Bevan on 0171 525 5411.

North Tyneside Council's twelve-page Green Plan is the result of an extensive environmental consultation exercise with local people. Over half of local residents were concerned about air pollution, although litter and dog fouling topped the list of environmental worries.

Refrigerated lorries parked overnight often lead to complaints about noise and emissions from their diesel generators. **Sainsbury's** may have the answer, with an experimental solar-powered refrigerated trailer which is both pollution-free and quiet. Claimed as a world first, the unit is now carrying fresh fruit and vegetables to stores in South East England. The picture shows the 35m² photovoltaic panel which also charges batteries to keep the refrigeration working overnight. The project is being monitored by the Southampton University Sustainable Energy Research Group.



Many member organisations were represented at this year's **Spring Workshop**, which was a sell-out. **Enviro Technology Services**, **CERC**, **Ashdown Environmental** and **Consultants in Environmental Sciences** were all demonstrating air quality management and modelling systems. The Workshop also provided an opportunity for delegates to discuss progress on local air quality management and assessment, and to identify problems which have arisen to date. A note of these discussions will be circulated to all delegates in a round-up mailing, and is available to other members on request.

Elsewhere...

What links **Guy Fawkes** with the **Landfill Tax**? One month after the tax was introduced last year, waste regulators from the Environment Agency noticed a number of massive bonfires being constructed around the country, and duly burned on 5 November. They suspect that some unscrupulous operators were indulging in creative fly-tipping under the guise (or Guys) of bonfires, and thus avoiding landfill charges. When does a traditional celebration become an unlicensed waste-to-energy project? NSCA would like to hear any suggestions for guidance.

Has anyone else noticed that official publications seem to have doubled in price since the privatisation of HMSO? Spare a thought for DOE, who now have to pay the Stationery Office for their own publications. Circulation of process guidance notes alone is costing a cool **£½ million**, we hear.

On the subject of **official publications**, curious rules apply during a pre-election period. NSCA has written and co-published with DOE a guide to EMAS. DOE hold the stocks. In a scene reminiscent of *Yes Minister* we asked DOE to send over seventy copies for a forthcoming seminar. "I'm sorry, we can't release bulk copies of

Government publications during an election". "But it's *our* booklet. We *wrote* it. EMAS isn't exactly controversial is it?". "Well...we can let you have three". We also tried to obtain 500 copies from DOE of the leaflet *Bothered by Noise* for the (DOE-funded) National Noise Awareness Day information packs. Again, the ban on bulk supplies was invoked. This time we were allowed six leaflets. Presumably this situation is unlikely to arise again for another five years.

The current DOE/DTI consultation paper on Green Claims tackles the tricky area of environmental claims on products. One of the first examples of this was the **ozone friendly** labels on aerosol cans, as ozone-depleting CFCs were replaced by hydrocarbon propellants. But hydrocarbons are implicated in the creation of ground level ozone, or summertime smog. So instead of *destroying* ozone up in the stratosphere, aerosol cans are now *creating* ozone down here where we don't want it. Which makes them friendly to ozone all right, but not exactly environmentally sound. However most consumers tend to confuse the ozone layer, the greenhouse effect, and air quality issues. Perhaps if cans were labelled "this product assists the formation of ozone", sales might even increase.

NSCA Divisional Meetings

Information about these events is available from Divisional Secretaries. Contact numbers are on page 86.

East Midlands

26 June: AGM, De Montfort University, Leicester
10 September: Boots Chemical Company, Nottingham
2 October: Divisional Council meeting, Kelham Hall
18 November: Coalite Chemicals, Bolsover

South West

25 September: Magnox Electric PLC, Berkeley Centre, Gloucestershire

Scottish

28 August: Managing Air Quality, University of Stirling

West Midlands

3 July: AGM. Speaker: Paul Cooney, Chairman of NSCA Council

Yorkshire & Humberside

23 September: AGM, Rotherham

BOOKS & REPORTS

Exposure of Buildings to Pollutants in Urban Areas - A Review of the Contributions from Different Sources.

D.J. Hall, A.M. Spanton, V. Kukadia, S. Walker. Building Research Establishment, BRE Report No. CR 209/96. December 1996.

This paper describes the characteristics of different types of pollutant sources in the way that they are experienced in a fixed locality in an urban area. The locality in this sense can also be a building or part of a building (a ventilation inlet for example). The most important parameter is the distance of the polluting source, and therefore the characteristic features of sources at different distances are discussed. The relationship between 'local' sources and 'background' levels of pollutants, their contributions to the total pollution levels and the vertical and lateral gradient of pollution are considered. The discussion is illustrated by examples from measurements of dispersing plumes and of urban pollution levels experienced during a specific investigation in a large urban area.

An important feature of assessing urban pollution is the degree to which existing monitoring stations (for example, those of the National Network) are representative of conditions over the locality. In practice pollution levels can show large fluctuations, which increase with reducing time scales, and significant spatial variation over short distances. As an example measured pollution levels on four sites in a large urban area, the West Midlands, were examined in detail for a period of one week during which data from an additional monitoring site was available. It was possible during this period to examine the pollution levels for averaging times down to one minute and spatial separations of 500m. Short term data correlations between the sites were generally poor.

The paper was prepared as part of the POLIS project (JOR3-CT95-0024) in the EC JOULE 95 programme.

Copies of the paper may be obtained, free of charge, from the authors or Ms Alison Goodwin, BRE, Garston, Watford, Herts WD2 7JR; Tel: 01923 814040.

Better than Bypasses: How a new approach to transport planning could solve local traffic problems better than road-building. Friends of the Earth, March 1997, £6.95, ISBN 1 85750 301 5.

The transport policy agenda is on the move. Environmental concerns, public opposition and budget cuts have all taken their toll. Of new trunk road projects started in 1995-96 only one was a bypass - the Newbury bypass. Steven Norris, the former Transport Minister, now says that Newbury was a mistake. However, there are still plans for over 60 more trunk road bypasses. Against this background the Friends of the Earth report argues for the UK's £1.6 billion trunk road bypass programme to be scrapped. Instead the campaign group says that funds should be diverted into demand management measures, such as: traffic calming; improving public transport; and, facilities for cyclists and pedestrians. At present bids for dozens of local transport packages are turned down by the DoT each year, whilst the cost of the proposed Salisbury bypass alone is equivalent to the DoT's entire annual budget for such local packages in England this year. With the passage of the *Road Traffic Reduction Act* many more local authorities may begin to look sympathetically upon the arguments presented in this timely report.

Towards Clean Transport, Fuel Efficient and Clean Motor Vehicles. OECD Documents. Microinfo 1996. £62.00 + p&p + VAT. ISBN 9264148205.

The report contains highlights of the Conference 'Towards Clean Transport, Fuel Efficient and Clean Motor Vehicles'. Held in Mexico City during March 1994, it was convened in response to concerns about increasing usage of motor vehicles and pollution from them. Motor manufacturers, fuel producers, researchers, governments and planners were all represented. The proceedings cover trends in vehicle production and use, megacities, sustainable transport, reducing impacts and use, economic and regulatory measures and conclusions of the conference.

Environment Business Directory, 1997/8. Information for Industry. £89.00, ISBN 09518375 59.

A very comprehensive directory of businesses and agencies in the environment field. 'Blue Pages' give a concise overview of legislation, agencies and responsibilities. Main listings are divided into Consultants, Equipment Suppliers, Lawyers, Laboratories, Waste Management, Utilities, Related services and NGOs and Associations. Regional listings are grouped by activity, and a Who's Who lists contacts in industry and agencies.

CORRECTION

Clean Air, May/June 1997

Please note the correct price of Brian Price's *Energy from Wastes* published by Financial Times Energy Publishing, is £195 (and not £350).

Photo-oxidants, Acidification and Tools: Policy Applications of EUROTRAC Results. *P. Borrell et al.* Springer, 1997, DM 128.00. ISBN 3540617833.

This book assimilates scientific results from the EUROTRAC, the European co-ordinated research project on transport and transformation of chemical pollutants in the troposphere over Europe. Major concerns are photo-oxidants, acidification of soil and water and atmospheric contribution to nutrient inputs to ecosystems. It presents results on local, regional and global scales, for use by scientists and policy makers.

Screening and Surveillance of Workers Exposed to Mineral Dusts. *G. Wagner, WHO, 1996. Sw. fr. 24.00. ISBN 9241544988.*

A comprehensive guide to the establishment of screening and surveillance programmes as a strategy for protecting health of workers exposed to respirable crystalline silica containing dust, coal mine dust and asbestos dust. The book covers principles of screening and specific approaches, methodologies, tests and examinations for detecting diseases. Examples of programmes around the world give further practical guidance.

Renewable Energy Strategies for Europe Volume II - Electricity Systems and Primary Sources. *M. Grubb, R. Vigotti. Earthscan. 1997. £14.95. ISBN 185383284.*

This study examines the implications of rapidly developing technologies for generation from renewables in tandem with the liberalisation of Europe's electricity systems. Emerging structures of electricity systems in Europe are examined together with the role of variable and dispersed electricity. The characteristics, development of and potential for renewable sources are then examined in detail. Given continuing liberalisation of the supply industry, the author concludes that by 2030 renewables could contribute up to half of Europe's electricity.

Countryside Law, third edition. *J.F. Garner & B.L. Jones. Shaw & Sons, 1997. £19.95. ISBN 0721910629.*

Revised to take account of developments in law and policy. The book aims to give a comprehensive assessment of how the laws of England and Wales tackle the twin objectives of protecting the countryside and wildlife while accommodating the public demand for greater access. It is aimed at both the specialist and more general reader.

**First
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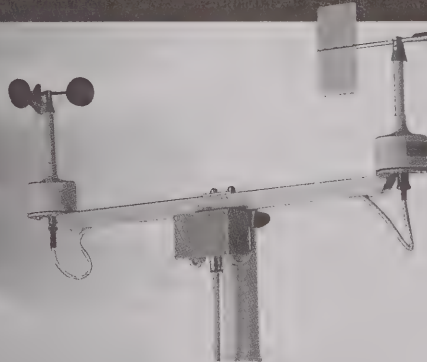


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FUTURE EVENTS

25 JUNE - Noise Pollution and its Implications for the UK Transport Industry

Noise pollution caused by the increase in traffic is a major environmental problem. This conference, presented by the Chartered Institute of Transport, will examine the policy and technical instruments available for the transport sector.

Venue: The Grosvenor Thistle Hotel, London.

Details: Nicola Jones, Waterfront Conference Centre, Tel: 0171 233 7600; Fax: 0171 233 7611.

25 JUNE - The Future of Transport in the Urban Environment

This conference marks the launch of *Transport in the Urban Environment*, the new title of the revised and rewritten Institution of Highways & Transport and DOT manual *Roads and Traffic in Urban Areas*.

Venue: Churchill College, Cambridge.

Details: Nigel Stevens or Wendy Sketchley, Tel: 01223 317708.

26 JUNE - Air Quality Management: Examining the Impact on Transport in the UK

Road traffic is a major contributor to airborne emissions; this conference, presented by the Chartered Institute of Transport, will look at the impact of measures, such as the National Air Quality Strategy, on transport operators.

Venue: The Grosvenor Thistle Hotel, London.

Details: Nicola Jones, Waterfront Conference Centre, Tel: 0171 233 7600; Fax: 0171 233 7611.

26-27 JUNE - Air Pollution Modelling for Local Authorities

A practical workshop for those managing and implementing air quality reviews.

Venue: University of Cambridge.

Details: Programme Administration, University of Cambridge, Programme for Industry, Tel: 01223 332722; Fax: 01223 301122.

27 JUNE - Environmental Regulation - Benefit or Burden

Held in conjunction with the Environment Agency, this seminar will look at the need for and benefits of strong environmental legislation against the financial and operational burden this entails. It will also review the Agency's first year and consider the good and bad aspects of environmental control and improvements needed.

Venue: Royal Aeronautical Society, London.

Details: WTI Training Group, Tel: 0118 981 3011; Fax: 0118 982 0755.

3-4 JULY - Eco-Management and Auditing Conference

Annual conference which aims to facilitate in-depth discussion of environmental management systems, associated standards and auditing methodologies.

Venue: The Manchester Conference Centre.

Details: ERP Environment, Tel: 01274 530408; Fax: 01274 530409

7-8 JULY - Incineration 97

First international symposium on incineration and flue gas treatment technologies. Key areas to be addressed include the fundamental and practical aspects of incinerator combustion and the process history of the various pollutants from their source through to removal. Co-sponsored by NSCA, ICE, Institutes of Energy & Physics, AICHE, CEA & the Filtration Society.

Venue: The University of Sheffield.

Details: Jennie Black, IChemE, Tel: 01788 578214; Fax: 01788 577182.

9-11 JULY - Mediation UK Annual Conference

Taking place under the title of "Growing, Renewing and Developing", this year's conference will be of particular interest to practising mediators and those who might want to understand the process better, either for themselves or in order to make more effective referrals. Programme includes plenaries, workshops, fringe meetings and network groups.

Venue: Stephenson Hall, University of Sheffield.

Details: Jane Lord, Mediation UK, Tel: 0117 904 6661; Fax: 0117 904 3331.

10 JULY - Developing Practical Transport Solutions for Urban Congestion

This conference, presented by the Chartered Institute of Transport, will assess the new policies and techniques which must be implemented if the problem of urban congestion is to be resolved.

Venue: The Selfridge Hotel, London.

Details: Nicola Jones, Waterfront Conference Centre, Tel: 0171 233 7600; Fax: 0171 233 7611.

23 JULY - National Noise Awareness Day

9-12 SEPTEMBER - Environmental Health Congress 1997

Opportunity for environmental health professionals to keep abreast of current developments; up-to-date information and examples of best practice in formal lectures, case studies and debates.

Venue: Bournemouth International Centre.

Details: June Balfe, Events Division, CIEH, Tel: 0171 827 5859; Fax: 0171 827 5868.

10-11 SEPTEMBER - Solutions '97

Four half-day seminars on water resource management and efficient use; air quality - industrial and urban; waste management; and producer responsibility.

Venue: G-Mex Centre, Manchester.

Details: IBC Conferences (Tiffany Goubard), Fax: 0171 631 3214.

15-16 SEPTEMBER - Environmental Policies in Europe: Towards Sustainability?

The seventh European Environment Conference will examine the extent to which environmental policies throughout Europe have promoted a shift towards sustainability.

Venue: The University of Leeds.

Details: ERP Environment, Tel: 01274 530408; Fax: 01274 530409.

18-19 SEPTEMBER - Business Strategy and the Environment

Sixth annual conference which will take a critical and in-depth analysis of corporate environmental management.

Venue: The University of Leeds.

Details: ERP Environment, Tel: 01274 530408; Fax: 01274 530409.

22-23 SEPTEMBER - Incineration of Municipal Waste with Energy Recovery

Short course to provide an introduction for all those considering the incineration option for the disposal of municipal solid waste. To provide detailed coverage of the incineration process and associated problems for those already involved in incineration. Specialist lectures on the theory and practice of incineration including combustion, incinerator design, refractories and pollution as well as practical experiences of incineration of municipal waste.

Venue: University of Leeds.

Details: Jamie Strachan, Department of Fuel and Energy, University of Leeds. Tel: 0113 233 2494; Fax: 0113 233 2511.

10 NOVEMBER - Transport and the Environment

NGO conference linked to the UN-ECE Regional Conference taking place on 13/14 November, enabling NGOs to prepare their own views on sustainable transport policies - see Update section of July-August 1997 issue of *Clean Air*.

Venue: Vienna.

Details: Gijs Kuneman, European Federation for Transport and the Environment, Fax: +32 2 537 7394.

JOINT CBI/NSCA CONFERENCE

IPPC Directive: Opportunity or Threat?

Tuesday 15th July 1997

Venue:
CBI, Centre Point
London

This Conference draws together the key interests and experts on IPPC.

It provides an opportunity for industry, local authorities and environmental groups to get up to speed on the issues, to help formulate their views, and identify the long-term implications of the issues for them.

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NSCA Training Seminar

Noise Update 1997

16 September 1997

Birmingham NEC

An opportunity for noise specialists to update on policy developments and practical issues in ambient noise management and neighbour noise control.

Details from NSCA

136 North Street, Brighton BN1 1RG

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Email: admin@nsca.org.uk

FORTHCOMING NSCA EVENTS

Tuesday 8 July 1997 (2.30)

Extraordinary General Meeting
CIEH, Chadwick Court, 15 Hatfields
London SE1

Tuesday 15 July 1997

Joint NSCA-CBI Conference
Integrated Pollution Prevention & Control
CBI, Centre Point, London

Tuesday 16 September 1997

Training Seminar
NEC Birmingham

Monday 20 - Thursday 23 October 1997

Environmental Protection 1997

NSCA's 64th Annual Conference - Glasgow

Tuesday 18 November 1997

Training Seminar
NEC Birmingham

Tuesday 11 November 1997

UK Dispersion Model Users Group
Olympia 2, London

Tuesday 18 November 1997

Training Seminar
NEC Birmingham

For list of forthcoming Divisional
meetings and events see page 111.

For further details please contact
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1997

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The 1997 edition has been substantially rewritten to include the draft National Air Quality Strategy, the Noise Act 1996, the Special Waste Regulations 1996, the Industrial Pollution Control (Northern Ireland) Order and the Waste and Contaminated Land (Northern Ireland) Order, alongside the usual chapters covering integrated pollution control, air pollution, waste, noise and water.

Appendices list prescribed substances, Part A and B processes and process guidance notes, smoke control authorised fuels, EC Directives, and water quality regulations. The Handbook is a set reference book for many university environmental courses.

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"The most definitive, and best value, guide to all pollution and waste legislation, controls and requirements in one volume. You should simply always have the latest edition on your shelf."

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CLEAN AIR

AND ENVIRONMENTAL PROTECTION

September/October 1997

- NSCA Noise Survey 1997
- Traffic Pollution - Major Public Worry
- Car Park Pollution - Exposure of Operatives & the Public
- Traffic Emission Data for Air Quality Reviews
- Problems and Enquiries with Part B Processes

Volume 27

Number 5

**NATIONAL SOCIETY FOR CLEAN AIR
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ENVIRONMENTAL PROTECTION 1997

Monday 20 to Thursday 23 October
64th Annual Conference and Exhibition
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The National Society for Clean Air and Environmental Protection produces information, organises conferences and training events, and campaigns on air pollution, noise and environmental protection issues. Founded in 1899, the Society's work on smoke control led to the Clean Air Acts. More recently NSCA has been influential in developing thinking on integrated pollution control, noise legislation, and air quality management.

NSCA's membership is largely made up of organisations with a direct involvement in environmental protection: industry, local authorities, universities and colleges, professional institutions, environmental consultancies and regulatory agencies. Individual membership is also available to environmental specialists within industry, local authorities, central government, technical, academic and institutional bodies.

Members benefit from joining a unique network of individuals who share an interest in a realistic approach to environmental protection policy; from access to up-to-date and relevant information; from reduced fees at NSCA conferences and training events. They contribute to NSCA's regional and national activities; to environmental policy development; to translating policy into practice; to the Society's wide-ranging educational programmes.

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EDITORIAL

Environmental Health: A New Beginning?

For environmental health - and indeed for public health - the last two decades have been in many respects an arid time. The concepts seemed to lose much of their resonance. The professionalisation of the Health Service and its concentration on curative issues tended to push wider social and environmental issues into the background. At the same time the environmental health service within Local Authorities seemed increasingly riven with doubt, as it contemplated the uncertain boundaries of its role and saw its function frequently lost within larger Departments.

Recently air quality has stood out against these trends: health-based standards and targets are now more fully enmeshed there than in other areas of policy. But it is clear that equivalent progress on those other aspects of the local environment on which the Society's work focuses will require new and reinvigorated concepts of environmental health.

There are now grounds for hope that the next few months may mark an important watershed. In its last days the previous administration published proposals on the environment as a key area for the Health of the Nation. This was welcome, but the proposals were flawed by the lack of ambitious targets on most fronts other than air quality, inadequate attention to housing, and the failure to integrate ideas across the different functions. It is welcome therefore that the new Government has promised that its policies will remedy these deficiencies, provide for health considerations to be taken more visibly into account in other policies, and bring new ideas together in a White Paper in the Autumn.

Meanwhile, the report of the CIEH's Commission on Environmental Health has been published. This may in turn be a landmark in public understanding and professional attitudes to environmental health. It adopts a contemporary vision of environmental health which sets functional specialisms within an explicitly holistic approach; recognises the importance of equity and of social influences; and sets environmental health squarely within the framework of sustainable development.

Both developments must be welcome. The Society's main focus remains on problems and policies in specific functional areas, such as air quality, noise, and waste management, but it has long urged the better integration of these functions at local level, most notably in the decision earlier this year to set up a Forum on Local Environment Management. This will pursue cross-cutting issues such as the balance between central and local government; the scope for flexibility at local level; the adequacy of resources; the balance between strategic development issues and management; and the role of voluntary initiative. Such issues are critical for ensuring that the various local services are better integrated and targeted, and hence for delivering overall environmental improvements.

But progress in the Society's work for a new and more fruitful approach to local environment management also depends upon a relevant vision of environmental and public health; an environmental health service able to take a broad and holistic view of its functions; and a government willing to adopt a more radical agenda.

By October, when Tessa Jowell, the new Minister for Public Health, leads an important session on Environment and Health at the Annual Conference, and when the work of the Society's Forum on Local Environment Management is fully underway, there are grounds for hoping that the pre-conditions for real progress may be in place.



ENVIRONMENTAL PROTECTION 1997

Monday 20 to Thursday 23 October
64th Annual Conference and Exhibition
GLASGOW

Conference session themes -

- Monday evening
 - *Opening Address - Sir Crispin Tickell*
- Tuesday morning
 - *Transport and Sustainability, The Service Sector and the Environment*
- Tuesday afternoon
 - *Business, Consumers and the Environment*
- Wednesday morning
 - *Local Environment: Dilemmas and Opportunities, Sustainable Cities*
- Wednesday afternoon
 - *A Sustainable Countryside, Open Policy Forum*
- Thursday morning
 - *Health and the Environment*
- *To obtain your copy of the Conference Brochure please contact the -*

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NSCA NEWS & VIEWS

NSCA Noise Survey 1997

Mary Stevens
NSCA Information Officer

With the imminent introduction of the night-time noise nuisance provisions of the Noise Act 1996, NSCA felt it was timely to review current attitudes of local authorities to dealing with noise nuisance and likely uptake of the night-time noise offence. A survey was sent out to all local authorities in the UK on 16 May 1997. An extremely high response rate was obtained, with 74% of authorities replying.

The 1997 survey follows an earlier one in February 1996 after the introduction of the Noise Bill into Parliament. NSCA's 1996 survey of local authority officers was intended to gauge their initial response to proposals for a night time noise offence. They were asked what were the current restraints on their ability to control noise nuisance. Out of 240 who responded, 49 (20%) said they were likely to adopt the proposed powers and 85 (35%), said they were unlikely to adopt them.

Introduction

The *Noise Act 1996* received Royal Assent in July 1996 and has now been fully implemented. The Act deals with noise nuisance from domestic premises. It covers England, Wales and Northern Ireland. (In Scotland the *Civic Government (Scotland) Act 1992* gives the police power to abate noise nuisance.)

Sections 2-9, which came into effect on 23 July 1997, are adoptive; they set out the procedure for dealing with night-time noise nuisance. If a local authority wishes to adopt these sections of the Act it must pass a resolution to do so, allowing three months between the resolution and implementation. Notice should be published in a local newspaper giving the commencement date. Night is defined as between 11.00 pm and 7.00 am, and local authorities have a duty to take reasonable steps to investigate any complaint about noise being emitted from a dwelling during these hours. If it is thought that noise exceeds, or might exceed the permitted level as measured within the complainant's dwelling, a warning notice should be served on the person who appears responsible for the noise. If the noise continues after the notice, the offender may be prosecuted and, if convicted, fined. Alternatively a fixed penalty notice may be issued.

Under Section 10 of the Act a local authority officer or other authorised officer may enter the dwelling to seize and confiscate any equipment which it is thought is or has been used to emit noise. Section 10(7) clarifies the powers of a local authority under section 81(3) of the *Environmental Protection Act 1990* to seize noise making equipment in order to abate noise nuisance. This came into force in September 1996, but does not apply to Northern Ireland.

Summary of Findings

Restraints on Ability to Control Noise Nuisance

In NSCA's Noise Survey 1996, 70% of respondents cited lack of staff and resources as the major restraint on their ability to control noise nuisance. By 1997 this had dropped to 63%. This possibly indicates that a higher priority is being given to noise in some areas. Inadequate legislation was cited by 18% in 1997 (19% in 1996); in 1997 11% (1996 - 14%) of respondents said lack of police co-operation was hindering noise nuisance control - so there has been no marked change in attitudes here.

Nearly a quarter of local authorities - 23% - felt that noise nuisance is being controlled effectively.

Major Sources of Complaint about Noise Nuisance

Neighbour Noise - Amplified music is the major source of complaint for 66% of responding authorities and second most common source for 23% - making it by far the single largest source of misery. Barking dogs were the major source of complaint for 26% of responding authorities and second most common for 45%. In 1991 the *Building Research Establishment National Noise Attitude Survey* found a slightly higher level of concern amongst the public about noise from dogs and other animals than from amplified sources (radio/hi-fi/TV). This survey also found a large number of people hearing, and bothered by, voices, children and banging doors. When action taken to reduce this noise was looked at, people were less likely to take action about noise from animals than about noise from amplified sources. In the case of amplified sound they were more likely to complain to the noise maker rather than the local authority or police. It may be that amplified noise has been perceived as something that the perpetrator can easily remedy.

Other Sources - Pubs and clubs were the major source of complaint from other sources - 56% gave this as the major source of complaint and 28% gave it as the second highest source. This was followed by industry with 38% giving it as the major source and 38% as the second most common source of complaint.

Change in Number of Complaints Over the Past Year

Neighbour Noise - According to 80% of responding local authorities, complaints about amplified music have increased, and 67% report an increase in complaints about dogs. A significant number of authorities reported an increase in complaints about all sources of noise except TV noise. Increasing levels of complaint to local authorities about amplified music could be attributed to greater awareness of the right to complain or to wider availability of louder sound equipment. The increase in complaints about dogs and other sources might suggest that increasing awareness of noise, and expectation of quiet, play a large part in levels of complaint. An NSCA survey in 1994 found that 82% of responding environmental health officers attributed increasing complaints about noise to higher expectation of quiet, 60% to selfish attitudes and 52% to poor sound insulation. This compares to 44% attributing complaints to more powerful sound equipment.

Other Sources - 72% of responding authorities report an increase in complaints about pubs/clubs while 42% reported increases in complaints about industry and construction sites.

Overall, there appears to be a massive increase in complaints relating to amplified music, assuming that complaints about pubs/clubs are largely related to this source.

Response to Complaints about Night-time Noise Out of Normal Office Hours

Of the authorities surveyed, 32% already provide cover for noise complaints out of hours, seven days a week and 5% provide weekend only cover. Nearly half of responding authorities had other arrangements. Only 14% provide no cover for night-time noise complaints. Inadequate resources were cited by 30% of respondents as the reason for no out of hours cover, 13% felt that complaints could be dealt with adequately in office hours. For 8% noise is not a major problem and a further 8% expressed concerns about staff safety. The majority of responding authorities have their own mechanism for dealing with noise complaints outside

normal working hours, to suit levels of complaint and resources available.

Threats to Officers Dealing with Noise Complaints

In 76% of responding authorities officers had experienced verbal abuse when dealing with noise complaints, 32% threats of physical violence and 5% had experienced assault. This compares to only 8% of respondents who felt that concern about staff safety was an obstacle to providing some sort of night-time noise service (this may not necessarily involve officers making night-time calls), while over a quarter - 26% cited concerns about safety as an obstacle to implementing the night-time noise provisions.

Take Up of the Night-Time Noise Provisions

The survey found that 25 (8%) respondents have considered or are likely to adopt the night-time noise provisions and 237 (79%) are unlikely to adopt. Among those not taking up the provisions, 43% said they considered existing noise cover adequate, 48% said lack of staff/resources prevented use of the provisions and 41% thought night-time cover would be an inefficient use of staff/resources (most authorities cited multiple reasons). A quarter (25%) consider existing legislation adequate.

In February 1996 NSCA undertook a survey of local authority officers to gauge their initial response to proposals for the night-time noise offence. They were asked what were the current restraints on their ability to control noise nuisance. Out of 240 who responded, 49 (20%) said they were likely to adopt the proposed powers and 85 (35%), said they were unlikely to adopt them.

Since February 1996, there appears to have been a sizeable swing against using the night-time noise provisions of the Noise Act.

Use of Confiscation Powers under Section 81(3) of the Environmental Protection Act

So far 33% of responding authorities have already used these powers and 48% plan to use them. Less than a quarter - 23% - had not used them. Of these, 37% had no need or did not plan to use them as yet. Others expressed concerns about procedures and legal implications.

In the 1996 survey 75% of respondents said they were likely to use the clarified powers of confiscation.

The full survey results are available from NSCA, £10.00.

INTEGRATED POLLUTION PREVENTION AND CONTROL

NSCA/CBI Conference

In its first joint venture with the CBI, the NSCA hosted a major conference, "IPPC Directive: Opportunity or Threat?", in London on Tuesday 15 July. The meeting attended by over 100 representatives from industry, academia, regulatory bodies and local authorities heralded the introduction of a new and expanded pollution control regime for UK industry. The EU Directive was adopted last September. Member States have until the 30 October 1999 to transpose its requirements into national law. Keynote speakers at the conference included: Michael Meacher MP, Minister for the Environment; Dr David Slater, Director of Environmental Protection, The Environment Agency; and Ruth Frommer, Director for Industry and Environment, European Commission.

The meeting coincided with the publication of the Government's first consultation document on the implementation of the EU Integrated Pollution Prevention and Control Directive into UK law. The Directive will create a more holistic approach to pollution control and is expected to provide an important catalyst for the development of more sustainable industrial processes. It will for the first time incorporate consideration of energy use, noise and waste recovery issues. As such the Directive should provide an important mechanism for helping to achieve the new Government's ambitious target of a 20% cut in CO₂ emissions by 2010.

The new regime will directly affect some 7,000 to 8,000 industrial installations in England and Wales - a fourfold increase on the approximately 2,000 processes controlled under the current Integrated Pollution Control (IPC) regime. These will for the first time include around:

- 1,500 to 2,500 installations in the *food, drink and intensive livestock sectors* - the majority of which are currently regulated under the Silage, Slurry and Agricultural Fuel Oil Regulations.
- 3,000 *waste management sites* - mostly landfill sites regulated by the Environment Agency under the *Waste Management Licensing Regulations 1994*.
- 1,500 *smaller industrial processes* currently regulated under local authority air pollution controls, plus trade effluent consenting and/or water discharge consenting.

The Government's consultation document raises a number of significant issues. Such as: the future allocation of responsibility for licensing Part B processes and the possibility of establishing a new system of Coordinated Pollution Control involving the Environment Agency, local authorities and other relevant bodies; the future of sectoral affordability; energy efficiency issues; and, the extent to which the IPPC and Environmental Impact Assessment consent systems might be brought together.

The NSCA will be preparing a full response to the consultation, which closes on 31 October 1997. Copies of the IPPC consultation paper are available free from the DETR (Tel: 0171-276 8408).

The proceedings of the NSCA/CBI IPPC meeting have been published and are available from the NSCA office as a conference pack, priced £25.00.

EUROPEAN ACIDIFICATION POLICY

NSCA/Jackson Institute Seminar

On 3 July 1997, NSCA held a joint seminar with the Jackson Environmental Institute at the School of Public Policy, University College London, on European Acidification Policy. The meeting brought together members of the Society's Technical Committee with a number of outside experts.

Those contributing to the meeting included: Dr John Murlis of the Jackson Environmental Institute, who presented a background paper on the draft EU Acidification Strategy; Dr Dick Derwent of The Meteorological Office, who spoke on the wider environmental context of acidification; Dr Sarah Metcalfe, of the University of Edinburgh, who discussed the contribution of atmospheric modelling; Dr Tim Allott, of UCL, who reviewed work on biological impacts on freshwater ecosystems; and, Mr Steve Sorrell, of the Science Policy Research Unit, who spoke on innovative regulatory approaches to acidification.

The meeting provided a useful and constructive forum for discussion which will in due course inform the development of the Society's response to the European Commission's draft "Strategy to Combat Acidification". It is hoped to organise a number of further seminars, on related topics, in cooperation with the Jackson Environmental Institute later this year.

GREEN CLAIMS - CODE OF PRACTICE

NSCA Response to Consultation Document

Introduction

Recent research¹ by the National Consumer Council has confirmed that many environmental claims for products are "...unverifiable, and/or vague, woolly, specious or misleading...Most are accompanied by a bewildering range of logos and symbols". Evidence² suggests that although consumers remain concerned about environmental issues (and particularly about air quality), they are cynical about product claims and feel that their purchasing decisions have little significance for the environment.

In order to address some of these concerns, the Department of the Environment (now Department of the Environment, Transport and the Regions) and the Department of Trade and Industry are proposing a voluntary code of practice. Such a code would, it is suggested, improve the quality of environmental

information given to consumers; it would establish benchmarks of good practice which business could reasonably be expected to follow and which consumers could reasonably expect to demand.

In welcoming the proposals, NSCA made the following comments.

The Policy Context

Much of the discussion about environmental labelling is driven by an implicit assumption that changes in purchasing decisions *are* important for the environment, and that if only consumers were properly informed and had the courage of their convictions, real environmental improvements could be achieved. The Government is developing an environmental information strategy³ based largely on this assumption, and the current consultation paper on Green Claims forms part of this strategy. But the strategy lacks an assessment of what contribution domestic consumption makes to environmental pollution, which sectors of the market have real potential to make contributions to securing environmental quality objectives, and what role environmental product information could make to realising that potential. For example, how much do consumers contribute, directly or indirectly, to VOC emissions, and how might improved consumer information (as opposed to voluntary industry agreements, regulatory or fiscal measures) be expected to reduce emissions? Most consumers still lack a fundamental understanding of environmental issues, their own contribution to environmental degradation, and the scope for change. In reassuring consumers that their actions *do* make a difference, it would be helpful to quantify real effects. In the example above, what would be the actual impact of a swing towards low-solvent paints?

The role for a Code of Practice

Discussions about green claims must be seen in this context. Part of the cynicism engendered by such claims is a feeling that the differences between competing products are marginal or irrelevant. There is a concern that green claims may encourage inappropriate consumption by implying that product X is positively beneficial for the environment, instead of relatively less damaging than product Y. However because environmental issues are complex and often involve an element of subjective judgement, there will be relatively few cases where green claims are so demonstrably false that they would justify prosecution under the *Trades Descriptions Act 1968*. We therefore welcome the principles outlined in the proposed Code of Practice, and the suggestion that it should initially be a voluntary one.

Ensuring the Effectiveness of a Code

Three things are required to ensure that the Code is effective:

- it has to be adopted widely by industry.
- it must be promoted and policed efficiently by an independent body.
- there must be adequate sanctions against companies which fail to abide by the Code.

On the first point, there would be little value in a Code if only a small number of interested companies “signed up” to a voluntary agreement. We would expect Government to make it clear, through negotiation with representative national bodies, that it expects all producers and suppliers in the UK to abide by the Code, and to expect due sanction if they fail to comply with it. Some industries might find value in developing sector-specific guidelines to help maintain standards, and consideration should be given to safeguards which protect innovative smaller companies from being subject to excessive complaints from larger competitors.

Secondly there is a clear need for an independent body to champion the Code, to provide the secretariat for adjudication, and to report on its effectiveness in achieving overall environmental objectives. No body is currently constituted to undertake this role, but three possible candidates are the Advertising Standards Authority, the Environment Agency (SEPA in Scotland), and the UK Ecolabelling Board.

Finally there must be a reasonable incentive for complying with the Code. This could be achieved by a system of complaints and published judgements, much as the ASA currently operates. The independent body charged with overseeing the Code would thus need to assemble a panel of respected adjudicators and ensure that judgements were fully publicised. This should prove a good incentive in its own right, but a secondary inducement to compliance might be an assurance from Government that the nature of the Code would be reviewed if it were not seen to be working on a voluntary basis.

References

1. Green Claims: A Consumer Investigation into Marketing Claims about the Environment. National Consumer Council, March 1996.
2. Stakeholder Pressures: Does Green Consumerism Really Exist? Liz Nelson, UK Ecolabelling Board, April 1997.
3. Information for Consumer Choice. John Hobson, Department of the Environment. Paper to the NSCA Annual Conference, October 1996.

EGM Unanimously Agrees Restructuring Proposals

At an Extraordinary General Meeting of the Society in London on 8 July, members of the Society, including representatives from all Divisions, gave their unanimous support to Resolutions for the restructuring of the Society.

There has been no major review of the Memorandum and Articles for many years, and there was clear acceptance by the meeting of the importance of ensuring that these were up-to-date, reflected best current practice, and would enable the Society to operate effectively in rapidly changing circumstances.

The proposals had been developed by the Committees and Council of the Society over the preceding year, and there was wide understanding of the issues which this review had raised. Members gave their continued support to the maintenance of a large, broadly-based Council with revised functions, designed to enable it to focus clearly on the wide-range of issues of policy and strategy confronting the Society. At the same time there was a recognition that considerations of effectiveness and accountability required the trusteeship function, and oversight of the operations and programmes of the Society, to be vested in a smaller Executive Committee which could effectively manage the Society's activities and affairs. The new arrangements also give to the Council and the Committee much greater flexibility in the establishment and dissolution of ad hoc and specialist committees, to enable them to respond more rapidly to changing circumstances.

The meeting had before it three alternative options for the appointment of members of Council. One would have seen Council representation at an equal level for all Divisions, regardless of their size. A second made the number of members of Council strictly proportional to the membership of Divisions. An overwhelming consensus within the Society, however, clearly felt that neither of these approaches gave proper weighting to Divisional representation, and that some more balanced arrangement was required. Accordingly, agreement was reached on an alternative proposal, which provided for all Divisions to nominate a minimum of four members of Council (including one trustee) and one additional Council member for each 250 of their members.

The new arrangements come into effect at the conclusion of the Annual General Meeting at the end of October. Before then the Divisions will be meeting to elect members to the Council, one of whom will also serve as a Trustee on the Executive Committee.

Commenting on the outcome of the meeting the Chairman, Paul Cooney, said "It is a tribute to our members that this fundamental restructuring has been carried through in such a rational and agreeable way. These changes will help ensure that the Society's structure and working practices remain responsive and up-to-date. I am sure they will help us pursue our objectives with even greater vigour and effectiveness."

NSCA Divisional Meetings

Information about these events is available from Divisional Secretaries. Contact numbers are on page 118.

East Midlands

2 October: Divisional Council Meeting, Kelham Hall

20 November: Visit to Coalite Chemicals, Bolsover

12 February 1998: Divisional Council Meeting, Kelham Hall

26 February: Visit to British Geological Survey

4 June: Divisional Council Meeting, Kelham Hall

1 October: Divisional Council Meeting, Kelham Hall

Northern Division

25 September: Visit to Fujitsu, Newton Aycliffe

South East

12 November: Transport: Sustainable Options for London and the South East (joint meeting with SEIPH).
London. Keynote speaker: Glenda Jackson MP, Minister for Transport in London

South West

25 September: Visit to Magnox Electric PLC, Berkeley Centre, Gloucestershire

Yorkshire & Humberside

23 September: AGM. Rotherham. Speaker: NSCA President Dame Barbara Clayton on
"The Health of the Nation Strategy, Past Present and Future"

REPORTS

Traffic Pollution - Still Top of The Public Agenda

Julie R Houghton, Elena Murray and David J Ball
Centre for Environmental and Risk Management,
University of East Anglia

Earlier this year the Centre for Environmental and Risk Management (CERM) at the University of East Anglia carried out a survey (sponsored by Norwich Union) to examine the extent of people's worries about a broad range of issues, including 'lifestyle', social welfare, financial and personal safety risks.¹ In total, 1,742 interviews were conducted, at home, among a nationally representative quota sample of adults age 15+ in Great Britain. The fieldwork was undertaken by

MORI and took place between 24-27 January 1997.

As well as eliciting people's spontaneous mentions of worry, the survey asked respondents to consider a list of 22 'worry items' and to rate each item according to a four point scale: "does not worry me" (1), "worries me a little" (2), "worries me a fair amount" (3), and "worries me a great deal" (4).

The results are shown in Figure 1.

The subject of traffic pollution emerges as a major item of worry in the survey. Thirty per cent of respondents stated that it caused them to worry a 'great deal', putting it in third place behind the effects of drug use (37%) and the state providing an adequate pension (32%). When adding in the proportion of respondents who worried a 'fair amount', traffic pollution takes over from the effects of drug use as the leading concern, occasioning at least a 'fair amount' of worry in close to 65% of respondents. This issue attracts a higher level of worry than that of food safety - a subject that was much in the media at the time of the survey as a result of the *E-coli* 0157 outbreak in Scotland. It is, furthermore, a central concern of every age group and is one of the topics that causes people to worry more now than they did a few years ago. Thirty seven per cent of respondents report that traffic pollution is a growing concern, placing the subject in third place behind burglary (42%) and having enough to live on in retirement (39%).

Among survey respondents living in the London area, 41% claim that traffic pollution worries them a 'great deal' and 74% worry at least a 'fair amount'. Only 4% claim that the issue does not worry them. Car ownership also influences worry about traffic pollution. Respondents without a car or van in the household are more likely to be concerned: 37% worry a 'great deal' compared with 28% of those with cars.

From Figure 1 it can be seen that those items occasioning the highest amounts of worry can be characterised in the main as social concerns. In contrast, certain 'lifestyle' factors (smoking, alcohol and exercise) that are identified as significant risks to health in the Health

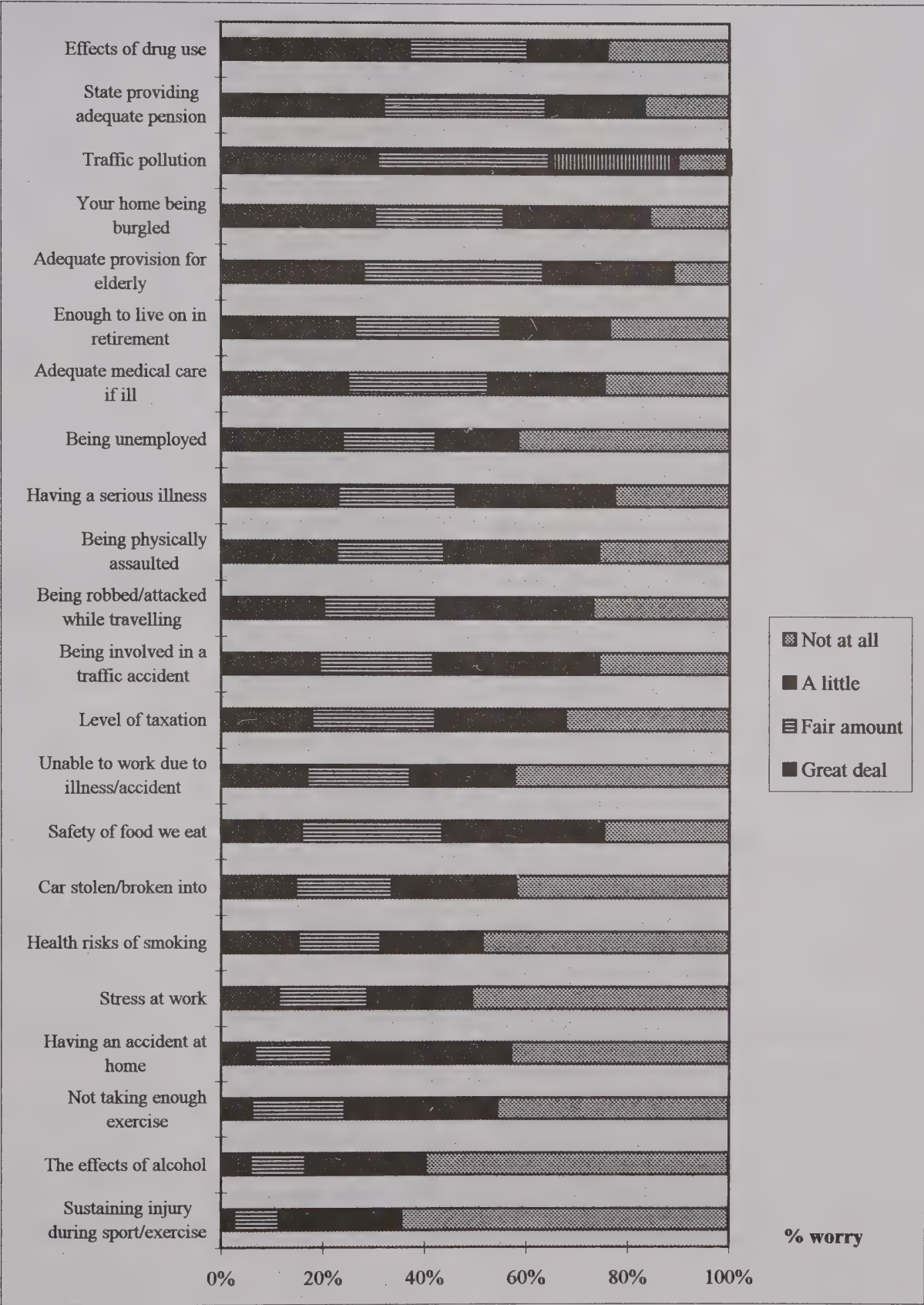
of the Nation Strategy are accorded only low levels of worry. Why might this be?

Research on the perception of risk reveals that the public use a broad range of values when comparing risks and that certain qualitative aspects of risk are important.² People worry more about those risks they characterise as involuntary, uncontrollable, unfairly distributed, or without benefit. They are also more likely to be concerned about risks that are unfamiliar or unknown to science.

In terms of its risk dimensions, while the toxic nature of vehicle emissions is recognised, the exact link between air pollution and health remains a matter of scientific uncertainty - although work in the last decade on PM₁₀, nitrogen dioxide, benzene and lead has made steady progress. From the public perspective, however, what drives concern may be the reported increase in the prevalence of asthma, but there is little evidence to support a direct causal link between asthma and air pollution and it is likely that the causes are multifactorial.³ There is also the possibility that traffic pollution may be associated in people's minds with greenhouse gas emissions and the state of the environment more generally.

The collective risk of traffic pollution arises from the aggregation of a multitude of individual activities and exposure to risk at this level is involuntary and uncontrollable. The car is, of course, the individualised mode of transport par excellence. Car drivers enjoy the independence, convenience and privacy that this form of travel offers and, thus far, its perceived advantages have outweighed the perceived risks of accident, noise and fumes. However, when traffic congestion reduces the

Figure 1: How much do you worry about...? (All respondents, n=1, 742)



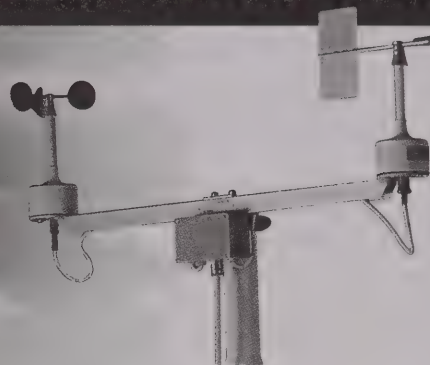
convenience of travelling by car, attitudes can change. If the perceived personal benefits of car travel are diminished, this is likely to generate more support for applying the precautionary principle, ie to accept rather than reject the health effects of vehicle emissions in the face of scientific uncertainty.⁴

A Department of the Environment survey found that concern over traffic exhaust increased by 17% between 1986 and 1993; some 23% of respondents were very worried about exhaust fumes and urban smog in 1986 and 40% in 1993.⁵ Traffic congestion was rated the most important local and national environmental issue and traffic (including congestion, fumes and noise) identified as one of the environmental trends that will be of most concern in 20 years time. This finding is supported by evidence from the 1995 British Social Attitudes survey that found that nearly nine in ten people believe that traffic congestion will either definitely or probably be one of the most serious problems for Britain over the next 20 years or so.⁶ The survey also found endorsement of the view that more priority should be given to pedestrians, cyclists and buses in towns and cities, even if this makes things more difficult for other road users. While attitudes towards the car appear to be changing, it remains to be seen whether national and local initiatives can translate this into a change in behaviour. Worry, after all, does not necessarily imply personal action.

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- 3 Malcolm Green, "Air Pollution and Health", *British Medical Journal* **311**, (1995)
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- 5 Department of the Environment, 1993 Survey of Public Attitudes to the Environment: England and Wales (1994)
- 6 Office for National Statistics, Social Trends 2 (1997)

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Developing a Local Air Quality Strategy

Tuesday 18 November 1997

NEC - Birmingham

"The Environment Act 1995 gives local authorities new duties and responsibilities which are designed to secure improvements in air quality, particularly at local level. As part of their commitment to sustainable development they should review the opportunities open to them and develop a local air quality strategy." The UK National Air Quality Strategy, 1997.

The National Air Quality Strategy asks all local authorities to develop a Local Air Quality Strategy (LAQS). This seminar will address the following questions:

- What should go into LAQS?
- Whose responsibility is it, and who else should be involved?
- How does it relate to statutory air quality management duties?
- How should it link to other planning and strategic functions?
- Can LAQSs be co-ordinated regionally?

Details: NSCA, 136 North St, Brighton BN1 1RG. Tel: 01273 326313 Fax: 01273 735802.

Email: admin@nsca.org.uk

Car Park Air Pollution Exposure of Operatives and the General Public

Dr. Michael Schwar, Jeff Booker & Lesley Tait
Stanger Science and Environment

Air pollution levels have been measured in 12 underground car parks and an assessment made of local air quality and ventilation arrangements in relation to Building Regulation requirements (1995) and Health and Safety Executive requirements (1995). The pollutants measured were oxides of nitrogen, carbon dioxide, carbon monoxide, benzene, ethylbenzene, toluene, xylene, and inhalable and respirable dust. Measurements were made typically between 7am to 7pm on one weekday and for 6 of the car parks on one day over a weekend.

The study showed that individual users' exposure to CO and NO₂ only exceeded recommended limits if considerable periods of time were spent in the car park. For car park employees, none of the pollutants measured exceeded the occupational exposure criteria in any car park surveyed. However, taking exposure to all pollutants simultaneously, it is evident that without careful management, staff could be exposed to combined pollutant levels above those recommended. These problems will be aggravated during periods of adverse climatic condition, ventilation plant failure, unusually high car park usage or excessive traffic flow and congestion.

Introduction

This paper describes the results of an air quality study within twelve underground car parks. The study was commissioned by the Department of the Environment, Construction Innovation and Research Management Division. Its purpose was to more fully understand pollution levels within underground car parks, as this is an important pre-requisite for decisions on control measures applicable to Building Regulations and local authorities.

Design of Study

The car parks selected covered a cross-section of sizes, ventilation systems, designs and usages as detailed in Table 1. Air Monitoring was carried out throughout the day at all twelve car parks during a weekday, and at six of the car parks on a Saturday. Two static air monitoring sites were selected in each car park. The site selection criteria used are given in Table 2.

The air monitoring equipment was housed in two vans which were parked at the selected monitoring locations. Sampling lines of inert material were led from the vans and sampling was undertaken at breathing height. Where possible, sampling was carried out from 7am to 7pm. However, selected VOCs were measured typically from 5.30 to 6.30pm. Details of the pollutants monitored and the instrumentation and techniques used are presented in Table 3.

An assessment of the ventilation performance of the air extract system was made from measurements of the air flow at terminal grille faces.

Assessment of Air Pollution Levels

Exposure of car park operatives

Guidance relating to personal exposure to substances hazardous to health in the work place is published by the Health and Safety Executive in Guidance note EH40/95 in support of the *Control of Substances Hazardous to Health*

Regulations (COSHH). These are presented in Table 4.

The Building Regulations requirements for below ground car parks, including exit and ramps, stipulate that CO concentrations should not exceed 55mg/m³ (50ppm) averaged over 8 hours or 110 mg/m³ (100ppm) for periods less than 15 minutes.

Exposure of general public

Exposure of the general public to pollution in the environment may be assessed through reference to guidance and standards published by the UK Department of Environment, the UK Expert Panel on Air Quality Standards, the World Health Organisation and other bodies such as the UK Chartered Institute of Building Services Engineers. These criteria are also presented in Table 4

Interpretation of results

Occupational exposure is generally measured over 8-hours or 15-minutes by personal samplers attached to the work force. However, this study was primarily an environmental study in which static samplers have been used. The air quality results obtained in this way should be taken, therefore, as indicators of, rather than measures of actual personal exposures.

For technical reasons, selected organic species were sampled for 1 hour only. These were converted to maximum 8-hour (and 15-minute) concentrations, using factors deduced from variations in VOC levels measured over the course of a day.

Car park users spend considerably shorter periods of time in a car park than do operatives. As their exposure is unlikely to be more than some tens of minutes at a time, a meaningful assessment is limited to exposure criteria up to 1 hour.

Air Quality Results

Results of air quality measurements for six of the pollutants are given in Tables 5 to 7. Examples of measured diurnal variations for five pollutants in a small car park and a large car park are presented in Figure 1.

Carbon monoxide (Table 5)

- Exposure of car park operatives: No car park had measured 15-min and 8-hour average CO concentrations which exceeded the occupational criteria.

No car park had measured CO concentrations which exceeded the Building Regulations requirements.
- Exposure of general public: One car park had measured 15-min, one a 30-min and two a 1-hour average CO concentration which exceeded the corresponding environmental criterion. The highest measured 15-min average CO concentrations reached 103% and 67% of the criterion. The two highest 30-min levels were 97% of criterion and 102% of criterion. The two highest 1-hour levels were 134% and 186%.
- Location differences: The highest 15-min average CO levels were measured at the exit of two car parks. A number of the car parks had CO levels inside the car park which were consistently higher than those measured at their exit.

Carbon dioxide

No car park had measured 15-min and 8-hour average CO₂ concentrations which exceeded the occupational or environmental criteria.

Nitric oxide

No car park had measured 15-min and 8 hour average NO concentrations which exceeded the occupational criteria.

Nitrogen dioxide (Table 6)

- Exposure of operatives: No car park had measured 15-min and 8-hour average NO₂ concentrations which exceeded the occupational criteria.
- Exposure of general public: Five car parks had measured 1-hour average NO₂ concentrations which exceeded the environmental criterion. The highest concentrations reached 151% and 143% of the criterion.
- Location differences: Five car parks exceeded the environmental criterion inside the car park and two exceeded it at the exit.

Benzene (Tables 7 and 8)

There are no criteria for judging short term exposures to benzene. The maximum occupational exposure limit is 16mg/m³ averaged over an 8-hour working day, for a 40hr working week. The standard guideline for environmental exposure is 16µg/m³ based on a year's exposure, and the target guideline averaged over a year is 3/2µg/m³.

Figure 1 shows examples of the diurnal variation in volatile organic compound (VOCs) concentrations measured in car park Nos 2 and 10. By ratioing the benzene and VOC concentrations approximate estimates have been made of maximum 15-min average benzene levels. These estimates are presented in Table 8. In the same way maximum 8-hour average benzene levels have been estimated.

An exposure of 1-hour/week for 50 weeks to a maximum 15-min average benzene concentration of B mg/m³ corresponds to an annual dose equivalent of 0.11B µg/m³. These estimates are also given in Table 8.

- Exposure of operatives: None of the car parks had an estimated average 8-hour benzene concentration in excess of the occupational exposure level of 16mg/m³.
- Exposure of general public: The approximate estimates of maximum annual dose equivalent concentrations range from 0.72 to 35µg/m³ inside the car park and from 0.3 to 9.4 µg/m³ at the exit.
- Location differences: The median annual dose equivalent concentration for all the car parks was 4µg/m³ inside the car park and 2µg/m³ at the exit. These compare with an annual average concentration recorded in a rural site of about 3µg/m³ and at a kerbside site in central London of about 10µg/m³.

Ethylbenzene, toluene and xylene (Table 7)

As for benzene the measurements were made in the late afternoon, typically 17.30 to 18.30. By ratioing these measured concentrations with the diurnal VOC concentrations, approximate estimates have been made of maximum 15-min and maximum 8 hour concentrations.

- Exposure of operatives: No car park had estimated concentrations which exceeded 4% of the respective 15-min and 8-hour occupational exposure limits.
- Exposure of general public: Estimated max 15-min toluene concentrations were in the range 0.2mg/m³ to 15mg/m³ with nearly half of them exceeding 2mg/m³. This suggests that a significant number of the car parks are likely to exceed the 30-min toluene odour criterion of 1mg/m³.

Respirable and total inhalable dust

No car park had a measured inhalable or respirable dust concentration which exceeded the specified criteria.

Ventilation Results

The results of ventilation measurements are presented in Table 9.

Four car parks had indicated total ac/h of 6 or more suggesting compliance with Building Regulations.

Three car parks had indicated total ac/h of 3.1 to 3.9. Here compliance with Building Regulations would occur if there was in addition to mechanical ventilation a

comparable natural ventilation component. As they were all enclosed car parks compliance is doubtful.

Four car parks had indicated total ac/h of 1.1 to 2.2 and did not, therefore, appear to comply with Building Regulation requirements.

Discussion

None of the pollutants measured exceeded the occupational exposure or Building Regulations air quality criterion in any of the car parks surveyed.

Where operatives are exposed to a number of pollutants, Guidance Note EH40 recommends that the combined sum of pollutant concentration/exposure criteria should not exceed unity. Table 10 shows the sum of these ratios for all the pollutants measured for each of the car parks. Unity is not exceeded in any of the car parks surveyed. However, care must be exercised in the interpretation of these data where markedly different modes of biological action occur, such as are associated with CO and dust.

The survey was carried out on days which were effectively selected at random throughout the study period. Conditions regarding car park usage, traffic flow and climatic conditions were not obviously different from 'normal' occurrences. Experience from other studies tells us that under average conditions, pollution levels to which people are exposed are generally adequately controlled. For the most part this has been shown to apply to this study as well. However, the margin of safety in some car parks, is not great. If one considers exposure to all pollutants simultaneously, it is evident that without careful management, staff could in some situations be exposed to combined pollutant levels above those recommended in Guidance Note EH 40/95. These problems will certainly be aggravated during periods of adverse climatic conditions, unusually high car park usage, excessive traffic flow and congestion, and ventilation plant failure.

With regard to the exposure of car park users the significance of individual exposure will depend on the period of time spent in the car park as well as the levels of pollutants outside. It has not been possible to directly measure the exposure of car park users to benzene, but extrapolation of the data available from static sampling points, suggests that under extreme conditions it could be equivalent to an annual exposure which is of the order of the UK benzene target (or standard) of $3.2\mu\text{g}/\text{m}^3$ (or $16\mu\text{g}/\text{m}^3$). Current ambient levels in some busy streets can approach these values. Frequent (that is about 5 days a week throughout the year) users of some underground car parks could receive a doubling of their annual ambient dose of benzene.

Since the car parks surveyed were built, provision has been made within the Building Regulations to deal with ventilation requirements for the protection of human health. The study did not seek specifically to check compliance of

these car parks with current Building Regulations relevant at the time of their construction, but rather to give a snap shot to show how performance compares with existing guidance in respect of specified air change rates and/or CO concentrations.

In the event of adverse operating conditions the situation in all car parks would be worse than that reported here, and occupational criteria for the protection of operatives could well be exceeded. The likelihood of adverse conditions occurring needs to be further investigated.

Conclusions

- (i) The highest pollutant concentrations tended to occur in the vicinity of car park exits.
- (ii) The results using static samplers indicate that no exceedances of the occupational exposure standards occurred. However, to obtain a more accurate assessment of occupational exposure, personal sampling techniques need to be used.
- (iii) In terms of the environmental exposure of car park users, the measured concentrations of CO exceeded the short term recommended standard (15 minute averaging period) in one car park by 3%. The recommended standards and guidelines framed over longer time averaging periods for CO and NO₂ were also exceeded on occasions. No direct measurements of long term benzene concentrations were made, but estimates of possible exposure levels suggest that for frequent users of some car parks under severe exposure conditions, the annual benzene dose could be comparable to that arising from exposure in the vicinity of moderately trafficked roads. However, to quantify this better, further measurements are necessary.
- (iv) Attendants where the highest levels were measured normally worked in a booth which was separately ventilated and so were not subject to the pollution levels indicated. However, this may not be the situation in all car parks and it is important that car park management is aware that it may be necessary to provide attendants with separately ventilated places of work.
- (v) It would be wise for control authorities and operators to note the contents of this study, and ensure that a risk assessment for people working and using underground car parks is carried out.
- (vi) The study was concerned with conditions in car parks under 'normal' conditions. Clearly, from time to time 'adverse' conditions can arise which will increase the risk to operatives and users. This may occur under certain climatic conditions, in the event of ventilation plant failure, vehicle breakdown or difficulties in vehicle movement within the car park, unusually high vehicle usage, and/or traffic congestion at the point of

- exit. It is important to take account of these possibilities when carrying out a risk assessment.
- (vii) It is recommended that the implications of the above mentioned adverse conditions, as well as possibly other circumstances, be examined with a view to establishing their likely magnitude and frequency of occurrence.
 - (viii) In the meantime, it is considered important that management procedures be confirmed to satisfy the control authorities that underground car park operators are able to cope with such adverse conditions.
 - (ix) Present underground car park management procedures should be reviewed to ensure that plant and staff are performing to the necessary standards. This should identify a named person responsible for the operation and maintenance of the ventilation. Car park attendants should be aware of the importance of knowing what action to take in the event of plant failure.

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Table 1: Car park specification, usage, and monitoring period

Car park number	Size Decks	Size Spaces	Ventilation Supply	Ventilation Exhaust	Ventilation Control	Usage ^a B/S/R	Monitoring Wkday/end
1	1	147	Natural	Natural	-	B & S	Wkday
2	1	60	Natural	Mechan	-	B & S	Wkday/end
3	1	50	Natural	Mechan	-	B	Wkday
4	2	250	Natural	Mechan	-	B & S	Wkday/end
5	1	350	Natural	Mechan	-	B	Wkday
6	3	380	Natural	Mechan	-	S & R	Wkday/end
7	6	205	Natural	Mechan	-	B & S	Wkday
8	6	248	Mechan	Mechan	-	B & R	Wkday
9	2	500	Mechan	Mechan	-	S	Wkday
10	3	558	Mechan	Mechan	-	B & S	Wkday/end
11	8	316	Mechan	Mechan	CO	S	Wkday/end
12	2	690	Mechan	Mechan	CO	S	Wkday/end

a B: Business; S: Shopping; R: Residential

Table 2: Monitoring site selection criteria for air pollution measurements

Monitoring site	Criteria
Inside car park	(a) In vicinity of where internal vehicle circulation occurs
	(b) Less than 1m from traffic aisle
	(c) Greater than 5m from natural air inlet
Exit of car park	(a) In vicinity of car park exit where flow of vehicles is concentrated
	(b) Less than 1m from traffic aisle
	(c) Less than 5m from attendant's cabin

Table 3: Instrumentation used for air pollution monitoring

Pollutant	Instrument	Principle	± Accuracy, ± Precision
CO	Dasibi model 3003 CO analyser	Intra-red gas filter correlation	10%, 0.7mg/m ³
CO ₂	ADC CO ₂ analyser	Non-dispersive infra-red	10%, 9mg/m ³
NO/NO ₂	Monitor Labs model 8840	Chemiluminescence	NO: 10%, 4µg/m ³ NO ₂ : 10%, 10µg/m ³
Benzene	Tube samplers	Sorbent adsorption	See footnote ^a
Ethylbenzene	"	"	"
Toluene	"	"	"
Xylene	"	"	"
Dust, respirable	Portable particulate monitors	MDHS 14	10%, 0.05mg/m ³
Dust, total inhalable	"	"	"
VOCs	Gastec Total Hydrocarbon Analyser	Flame ionisation detection	-
Data collection	EnviroLogger model 2000E	Solid state	-

^a Limit of detection estimated to be 3µg/m³

Table 4: Air quality criteria

Substance	Note	Units	15 min	30 min	Averaging period 1 hour	8 hour	Annual
<i>Occupational</i>							
CO	1	mg/m ³	330	-	-	55	-
CO ₂	1	mg/m ³	27,000	-	-	9,000	-
NO	1	mg/m ³	45	-	-	30	-
NO ₂	1	mg/m ³	9	-	-	5	-
Benzene	2	mg/m ³	-	-	-	16	-
Ethylbenzene	1	mg/m ³	-	-	-	435	-
Toluene	1	mg/m ³	560	-	-	188	-
Xylene ^a	1	mg/m ³	650	-	-	435	-
Dust, respirable	3	mg/m ³	-	-	-	10	-
Dust, total inhalable	3	mg/m ³	-	-	-	5	-
<i>Building Regulations</i>							
CO	4	mg/m ³	110	-	-	55	-
<i>Environmental</i>							
CO	5	mg/m ³	100	58	29	12	-
CO ₂	6	mg/m ³	-	-	-	9,000	-
NO	7	µg/m ³	-	-	-	-	750
NO ₂	8	µg/m ³	-	-	200	-	40-50
Benzene - standard	9	µg/m ³	-	-	-	-	16
Benzene - target	9	µg/m ³	-	-	-	-	3.2
Ethylbenzene	7	mg/m ³	-	-	-	-	11
Toluene	10	mg/m ³	-	1 ^b	-	-	7.5 ^c
Xylene ^a	7	mg/m ³	-	-	-	-	11

^a Mixed isomers; ^b For protection from odours; ^c 24 hour average

Notes

- Guidance Note EH40/95, Occupational Exposure Limits. Health & Safety Executive, HMSO, 1995. Approved Occupational Exposure Standards (OES).
- As 1, but Maximum Exposure Limits (MEL).
- As 1, not strictly OES; these are levels which trigger the application of the COSHH Regulations.
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Table 5: Maximum CO concentrations in mg/m³ averaged over 15 min, 30 min, 1 hour and 8 hours, measured inside the car park and at the car park exit

Car park number	Inside car park				Exit of car park			
	15 min	30 min	1 hour	8 hour	15 min	30 min	1 hour	8 hour
<i>Weekdays</i>								
1	2.2	1.7	1.5	1.0	30	17	12	5.1
2	30	25	20	13	17	9	5.9	3.6
3	37	27	19	7.0	5.6	5.3	3.5	1.6
4	8.2	5.3	4	2.0	7.2	5.2	4.4	2.1
5	18	14	11	3.4	5.2	3.4	3.2	1.9
6	13	10	6.6	3.3	27	17	12	4.2
7	20	12	11	3.1	11	10	7.1	3.9
8	18	12	7.9	5.0	103	56	34	11
9	28	27	25	17	12	9.6	8.5	6.3
10	33	31	29	21	48	41	39	27
11	12	11	10	6.8	14	13	12	9.2
12	40	34	30	24	65	59	50	35
<i>Weekends</i>								
2	12	9.8	7	3.8	8.8	8.4	7	2.9
4	35	25	16	6.1	16	15	13	7.5
6	4.2	3.1	2.4	1.2	4.5	2.7	2.3	1.4
10	49	35	28	19	34	26	23	15
11	12	11	9.5	6.4	21	17	15	7.8
12	47	44	42	29	67	57	54	41
<i>Air quality criteria</i>								
Occupational	330	-	-	55	330	-	-	55
Environmental	100	58	29	12	100	58	29	12
Building Reg.	110	-	-	55	110	-	-	55

Table 6: Maximum NO₂ concentrations in µg/m³ averaged over 15 min, 1 hour and 8 hours, measured inside the car park and at the car park exit

Car park number	Inside car park			Exit of car park		
	15 min	1 hour	8 hour	15 min	1 hour	8 hour
<i>Weekdays</i>						
1	50	45	32	100	71	55
2	536	301	170	119	73	57
3	137	90	72	80	50	34
4	82	68	54	73	65	56
5	213	187	141	140	122	105
6	170	134	102	125	110	99
7	241	229	182	306	231	169
8	63	74	51	225	114	69
9	304	285	243	307	238	209
10	170	121	97	225	139	113
11	119	115	91	141	126	107
12	149	214	130	139	108	73
<i>Weekends</i>						
2	136	16	83	113	96	69
4	190	169	129	180	196	127
6	99	62	46	80	68	52
10	309	263	199	178	175	155
11	119	115	94	217	159	127
12	155	139	110	139	118	56
<i>Air quality criteria</i>						
Occupational	9,000	-	5,000	9,000	-	5,000
Environmental	-	200	-	-	200	-

Table 7: Benzene (B), ethylbenzene (E), toluene (T) and xylene (X) concentrations in mg/m³ averaged over 1 hour, measured^a inside the car park and at the car park exit

Car park number	Inside car park				Exit of car park			
	B	E	T	X	B	E	T	X
<i>Weekdays</i>								
1	0.09	0.58	0.25	0.31	0.10	0.10	0.63	0.19
2	-	-	-	-	0.08	0.05	0.49	0.12
3	0.22	0.05	0.29	0.21	0.01	0.00	0.02	0.02
4	0.09	0.09	0.40	0.12	0.07	0.04	0.57	0.09
5	0.06	0.03	0.28	0.08	0.09	0.42	2.1	0.25
6	0.07	0.05	0.40	0.08	-	-	-	-
7	0.11	0.06	0.55	0.11	0.19	0.68	3.4	0.47
8	0.08	0.04	0.40	0.11	0.16	0.09	0.53	0.19
9	0.87	0.32	2.1	0.71	0.15	0.08	0.77	0.18
10	0.50	0.50	1.8	0.42	0.35	0.50	2.0	0.37
11	0.15	0.08	0.67	0.13	0.20	0.10	0.67	0.16
12	0.49	0.21	1.2	0.54	0.34	0.17	0.83	0.37
<i>Weekends</i>								
2	0.23	0.10	0.70	0.21	0.05	0.03	0.26	0.08
4	-	-	-	-	-	-	-	-
6	0.10	0.63	3.7	0.38	0.13	0.67	4.0	0.41
10	0.20	0.07	0.60	0.17	0.25	0.07	0.69	0.12
11	0.49	0.20	1.2	0.45	0.38	0.18	1.0	0.39
12	0.19	0.11	0.73	0.27	0.87	0.32	2.1	0.71

^a Measurements made late afternoon, typically 17.30 to 18.30**Table 8:** Benzene concentration measurements averaged over 1 hour, estimated maximum 15 minute concentrations and 50 hour annual dose equivalent concentrations, inside the car park and at the car park exit

Car park Number	Measured1 hour mg/m³	Inside car park		Measured 1 hour mg/m³	Exit of car park	
		Est. max 15min mg/m³	50 hr ann dose.equiv µg/m³		Est. max 15min dose.equiv mg/m³	50 hr ann dose. equiv µg/m³
Weekdays						
1	0.09	-	-	0.10	0.22	1.3
2	-	-	-	0.08	0.13	0.75
3	0.22	1.1	6.3	0.01	0.10	0.57
4	0.09	-	-	0.07	-	-
5	0.06	0.90	5.1	0.09	0.26	1.5
6	0.07	0.70	4.0	-	-	-
7	0.11	-	-	0.19	0.44	2.3
8	0.08	-	-	0.16	0.28	1.6
9	0.87	-	-	0.15	0.18	1.1
10	0.50	0.63	3.6	0.35	1.1	6.4
11	0.15	1.3	7.3	0.20	0.41	2.3
12	0.49	1.1	6.0	0.34	1.7	9.4
Weekends						
2	0.23	0.29	1.7	0.05	0.05	0.30
4	-	-	-	-	-	-
6	0.10	0.13	0.72	0.13	0.39	2.2
10	0.20	0.41	2.3	0.25	0.74	4.2
11	0.49	6.1	35	0.38	1.4	8.1
12	0.19	0.48	2.7	0.87	-	-
Air quality criteria						
Env. standard	-	-	16	-	-	16
Env. target	-	-	3.2	-	-	3.2

Table 9: Measured indicated mechanical ventilation rates in car parks

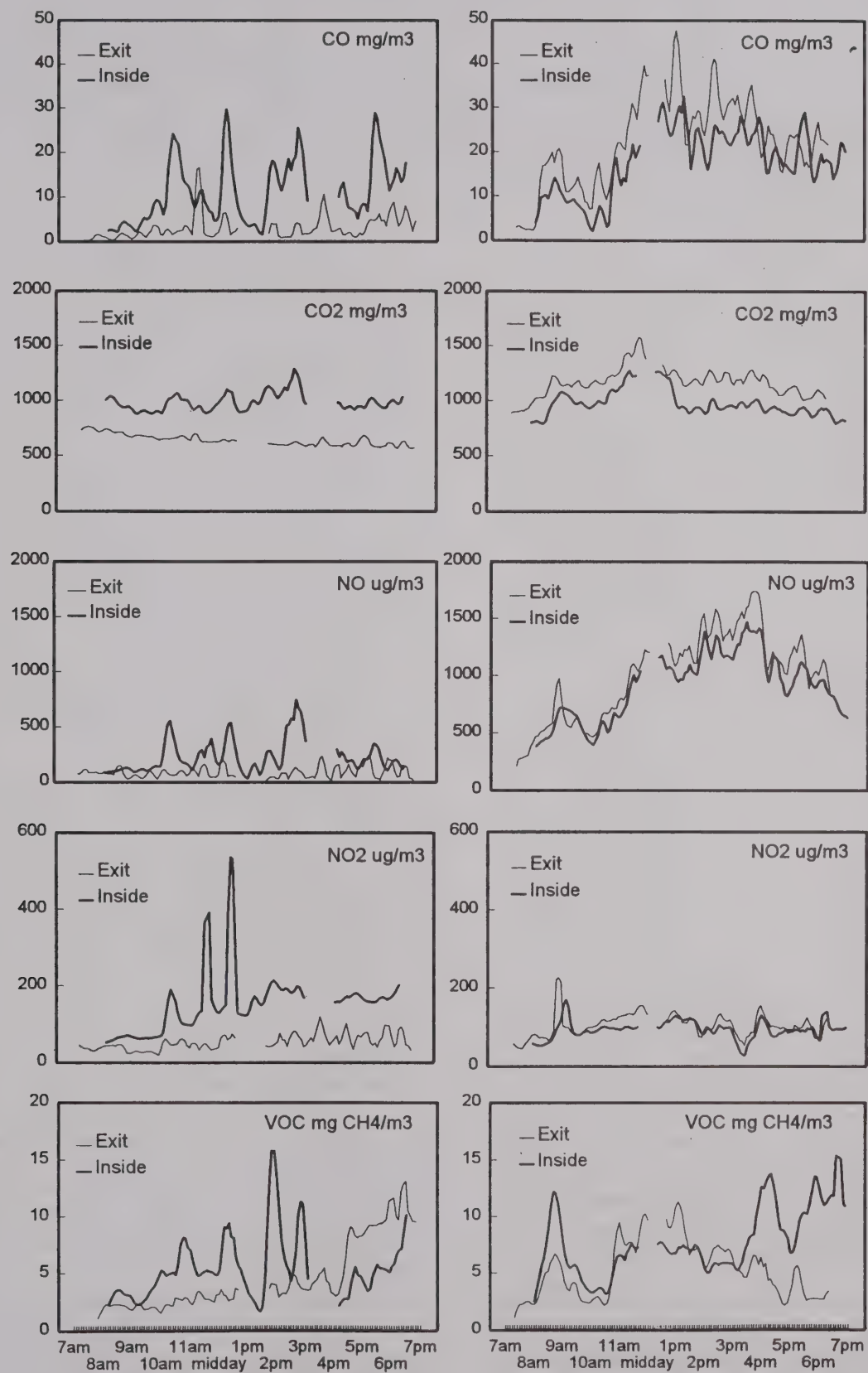
Car park number	Car park volume m³	Number of decks	Ventilation rate ac/h
1	6,720	1	-
2	2,900	1	3.9
3	3,830	1	(3.1)a
4	29,600	2	(1.4)
5(i)	29,600	1	1.7
5(ii)	-	1	7.2
6	24,600	3	(0.5)
7	14,800	6	(2.2)
8	10,700	6	(1.1)
9	37,800	2	7.9
10	33,900	3	3.5
11	33,600	8	6.6
12	36,400	2	8.1

^a Values in parenthesis based on a measured induced air flow at grille face <1m/s

Table 10: Air quality compliance with combined occupational exposure to CO, CO₂, NO, NO₂, benzene, ethylbenzene, toluene, xylene and dust based on measurements inside the car park and at the car park exit. Compliance is expressed as the sum of the ratios of separate concentrations relative to their OEL or MEL; a figure less than 1.00 indicates overall compliance

Car park number	Inside the car park	Exit of car park
<i>Weekdays</i>		
1	0.13	0.21
2	0.39	0.16
3	0.26	0.14
4	0.19	0.19
5	0.23	0.19
6	0.21	0.19
7	0.22	0.27
8	0.24	0.59
9	0.48	0.27
10	0.63	0.78
11	0.28	0.33
12	0.67	0.93
<i>Weekends</i>		
2	0.23	0.22
4	0.32	0.31
6	0.13	0.20
10	0.59	0.46
11	0.26	0.34
12	0.75	0.97
<i>Air quality criteria</i>		
Occupational	1.00	1.00

Figure 1: Air pollution levels measured inside and at the exit of two car parks, expressed as a running 15-minute mean concentration



Small car park: 60 spaces, 1 deck,
natural air supply and mechanical
exhaust

Large car park: 558 spaces, 3 decks,
mechanical air supply and mechanical
exhaust

Traffic Emission Data for Air Quality Reviews

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This paper describes the results of a recent research project undertaken on behalf of the UK Department of Transport comparing three emission data sources - the Design Manual for Roads and Bridges (DMRB), MODEM and the German Workbook on Emission Factors for Road Traffic (HB-EFA). The source and operation of the databases are described, their manner of operation assessed and the actual emission data compared.

Introduction

The *Environment Act 1995* has a provision that will require local authorities to review air quality in their areas against targets to be set by the Government. Where air quality objectives are not expected to be achieved, authorities will be required to establish local air quality management plans. The United Kingdom National Air Quality Strategy sets out proposed objectives for eight pollutants against which local authorities will need to assess air quality. The Strategy identifies traffic management schemes as one of the types of measures that may be used to reduce vehicle emissions.

An essential component of an air quality review is the compilation of an emissions inventory for the study area. Typically in an urban area motor vehicle emissions can make up over 70% of the total emissions of air pollutants. Therefore the quality of vehicle emissions data used is extremely important. Data are available from many sources such as the Design Manual for Roads and Bridges (DMRB). More recently other sources have been introduced, such as the MODEM model and the German Workbook on Emission Factors for Road Traffic (HB-EFA). These new sources extend the type of data available and provide a valuable complement to the existing sources.

Design Manual for Roads and Bridge, Volume 11

Volume 11 of the DMRB provides guidance on the environmental assessment of trunk road schemes. The air quality section of this document contains a method for the calculation of a contribution of a road scheme to total atmospheric pollutant emissions. The method includes details on average emission rates of five pollutants - carbon monoxide (CO), nitrogen oxides (NO_x), hydrocarbons (HC), particulate matter (PM) and carbon dioxide (CO₂) - for light and heavy duty vehicles as a function of vehicle speed.

The average emissions are based on an assumed vehicle fleet composition for each year up to 2020 together with measured and assumed emission rates for the various vehicle classes. For this study the background emission data for each of the vehicle classes were supplied in the following groups:

- non-catalyst petrol cars (pre 1992)
- catalyst petrol cars (1993-1996)
- catalyst petrol cars (1997-2000)
- catalyst petrol cars (2000-)
- diesel cars (pre 1992)
- diesel cars (1993-1996)
- diesel cars (1997-2000)
- diesel cars (2000-)
- heavy duty vehicles (small, medium and large)

In practice the emissions data for 1996 and 2000 vehicles were obtained by scaling other measured data. All emission data are for vehicles operating with warm engines.

The data are presented as series of tables and the user must calculate overall fleet emissions data by assuming a vehicle composition for the local network and assessing a suitable weighted average by hand.

German Workbook on Emission Factors for Road Traffic (HB-EFA)

The Workbook on Emission Factors for Road Traffic (HB-EFA) was compiled on behalf of the German Federal Environmental Agency and the Federal Ministry for the Environment, Forestry and Agriculture, Berne. The emission factors in the Workbook were obtained from vehicle testing on a representative sample of light and heavy duty vehicles. The range of pollutants data available is more extensive compared with the DMRB data and includes methane, non-methane hydrocarbons, benzene, sulphur dioxide and lead as well as the standard pollutants. Data are also available for other vehicle types, such as coaches, buses, mopeds and motorcycles.

The Workbook is a Windows based PC database and processor available on CD ROM. At present the database is available in a German and French version but it is reported that an English version is being considered. The user can choose to calculate emission data for a set of vehicle types, engine sizes and engine concepts. The results can be called up on three different levels of detail. The simplest gives only one weighted emission factor. This may then be broken down further to give emissions by vehicle concept (in the case of the passenger vehicle, e.g. conventional,

catalyst and diesel) as well as the weighting by which they are represented in the averaged emission factors. Finally emission factors are available for individual vehicle strata (by vehicle concept and engine size) as well as the weighting by which they are represented in the averaged emission factors. The user must select a calculation for a particular road type, for example 'motorway general 120 kmph, main road outside built up area'. This is in contrast to the other data sources which are based on a specific vehicle speed.

In addition to normal vehicle operation (i.e. emissions when warm) the model can also estimate cold start emissions and evaporative hydrocarbon emissions.

As with the DMRB the emission data for 1996 and 2000 standard vehicles have been estimated for emission tests on existing vehicles scaled by an appropriate factor.

Modelling of Emissions and Consumption in Urban Areas (MODEM)

The MODEM model is based on an EC DRIVE research project carried out by four European partners. Data were derived from laboratory tests to form the basis of the emissions model. Pollutant emission tests were carried out using a representative sample of 150 cars of different types. The pollutant emission factors are reported as a function of vehicle speed and acceleration/deceleration. Emission data are available for carbon monoxide, nitrogen oxides and hydrocarbons (together with carbon dioxide and fuel consumption) for vehicles with warm engines. An example of the data is shown below in Figure 1.

The emission data are available only for light duty vehicles split into four categories. Within each category the results are further divided by engine size (<1.41, 1.4-2.01 and >2.01). The four vehicle types available are those built to 15.03 and 15.04 standards, petrol engined cars with three way catalytic converters and diesel engined cars.

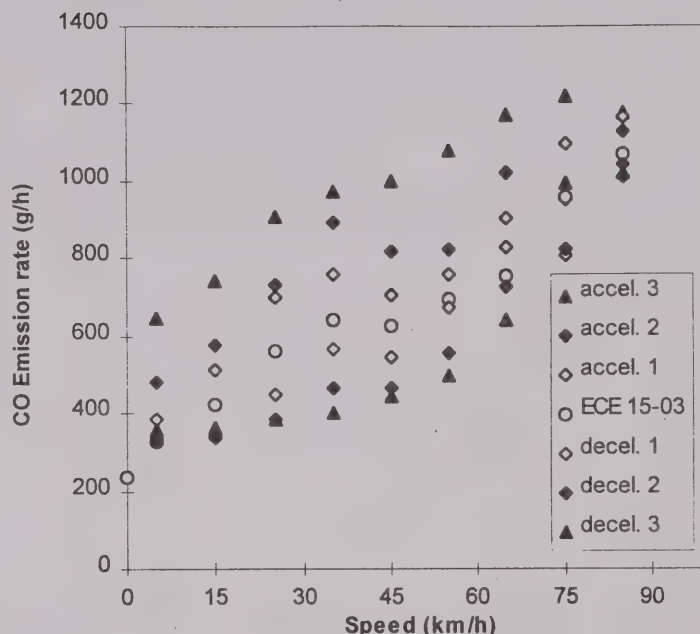
The MODEM model is a PC based software package. Its main intended use is to calculate emissions over a user defined driving cycle. A data file must be prepared containing a second by second speed profile for the cycle. The model then calculates emissions for the total cycle and on a second by second basis.

The actual emissions data on which the model is based are readily accessible in a separate data file. Therefore, in practice, for simple steady state situations it is easier to obtain the information directly from the data file than use the software supplied.

Comparison of Data

To compare the data contained in each of the three sources, common sets of emission information were extracted. Steady state (i.e. constant speed) emission data are available in all three sources for a range of car types. The DMRB and the HB-EFA both contain emission data for

Figure 1: Carbon Monoxide Emission Classified by Speed and Acceleration



HGVs. Particulate emission data are available for diesel vehicles in the DMRB and HB-EFA. The following vehicle types were used because these were common to all data sets and represented some of the more common vehicles in the UK fleet:

- petrol engined vehicles operating within 15.04 emission standards;
- petrol engined vehicles with catalysts;
- diesel engined light duty vehicles - current fleet;
- diesel engined vehicles operating within Euro 2 and Euro 3 standards;
- heavy duty vehicles.

In general, the data reported for carbon monoxide and hydrocarbons in each of the sources were similar; an example of the data for 15.04 standard vehicles is shown in Figure 2. However, significant differences in nitrogen oxides and particulates data were noted.

For nitrogen oxides for 15.04 standard vehicles there are large differences both in the absolute values of the data and the trend in emission values (see Figure 2). Both the HB-EFA and the MODEM model suggesting minimum emissions at low vehicle speeds while the DMRB data reports maximum emissions at this condition. For other vehicle types the trends were similar but with considerable variation in the absolute values, particularly at low vehicle speeds.

Particulate emission data are only available in the HB-EFA and the DMRB. The DMRB data are acknowledged to be based on limited testing and therefore must be considered as tentative. The trends in the emissions values are similar in each of the sources but there are some considerable differences in the actual values. In addition, the emission rates reported are low in comparison with

emissions of other pollutants and when used in dispersion models tend to predict very low concentrations. The supplementary DMRB information supplied also gives useful data on the size fractions of the particulate. This information suggests that all particulates in diesel emissions have a diameter of less than 10 μm and over 90% less than 2.5 μm . Petrol engined particulates are somewhat larger with 80% less than 10 μm and 67% less than 2.5 μm . None of the emission data sources have information on the actual quantities of particulate matter produced from petrol engined vehicles.

The emissions data for heavy duty vehicles, although agreeing in the general trends, have considerable differences in the actual values reported with variations of 200% at some conditions in the hydrocarbon and nitrogen oxides values (see Figure 3). The differences are likely to have arisen from a relatively small number of vehicles tested and differences in vehicles tested.

Figure 2: Speed Related Emission Rates for Petrol Cars (1.4-2.01 and 15.04 Emission Standard)

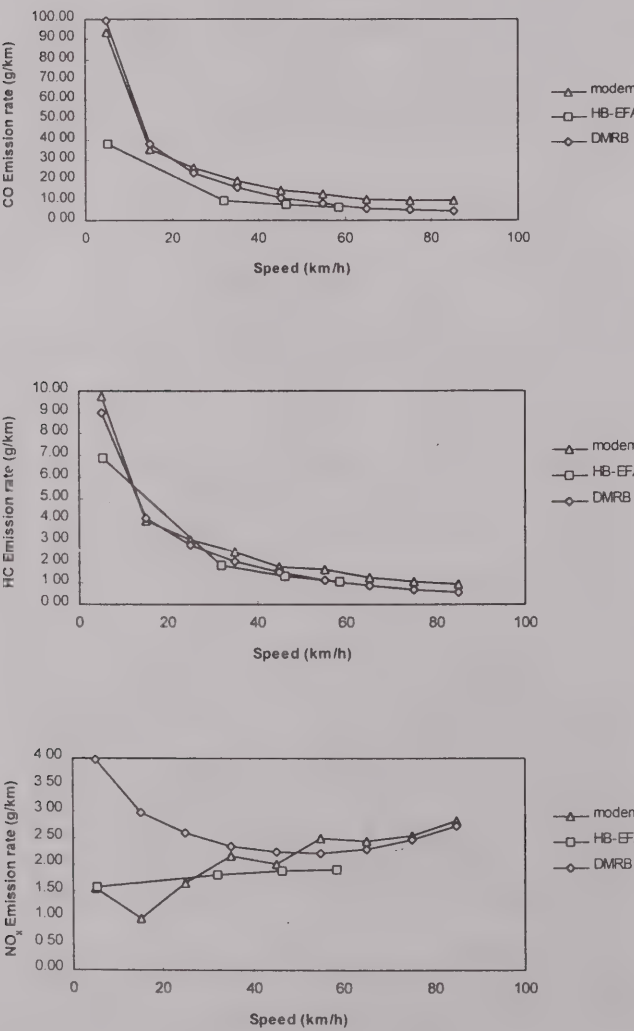
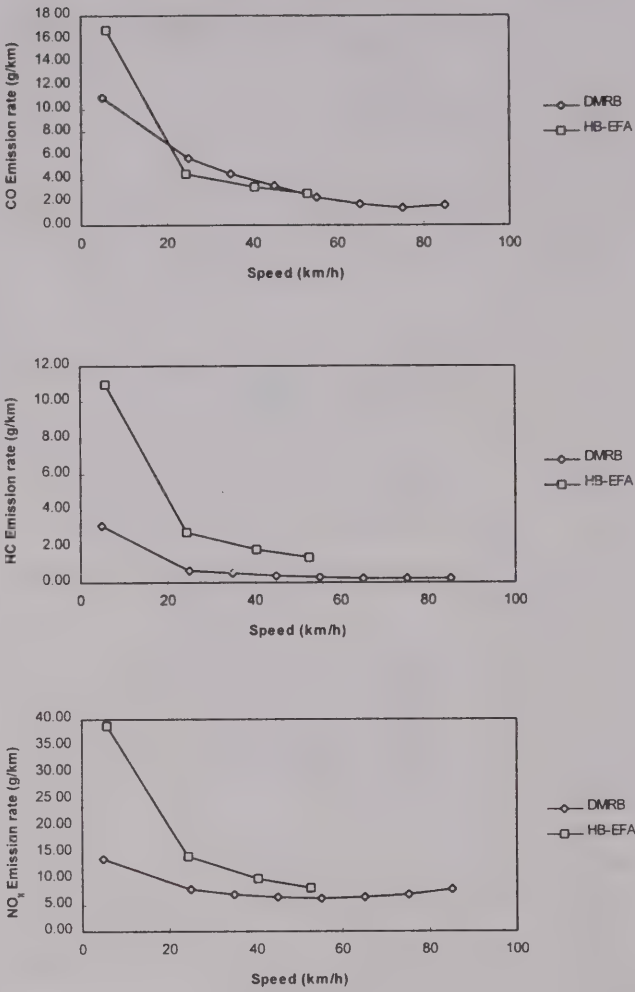


Figure 3: Speed Related Emission Rates for HDVs



Discussion

Examination of data sources for light duty vehicles suggests a good level of consistency for carbon monoxide and hydrocarbon emissions. However, the information for nitrogen oxides and particulates, potentially the most important pollutants when conducting an air quality review, is based on a limited amount of data and is not consistent within each of the sources. Both the absolute values reported and the trends differ between the sources.

Similarly, the information on heavy duty vehicle emissions is based on a small vehicle sample and the differences in reported data are considerable particularly at low vehicle speeds.

The results of this review suggest that there are some important weaknesses in the emission information available for conducting air quality reviews. The two pollutants identified in the National Air Quality Strategy as being the most likely to exceed the objectives (i.e. nitrogen dioxide and particulates) require further research to fully understand their emission characteristics. There are also important differences in the data reported in each source for these pollutants and appropriate care is required when using these data.

Acknowledgements

This paper is based on research conducted for the DITM section of the UK Department of Transport. We are grateful to the Department of Transport for permission to publish this paper. The views expressed are those of the authors and not necessarily of Ove Arup & Partners nor of the Department of Transport.

Software

The HB-EFA software is available from INFRAS AG, Mühlemattstrasse 45, CH - 3007 Berne. The MODEM model is available from the Transport Research Laboratory, Old Wokingham Road, Crowthorne, Berkshire RG45 6AU.

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A Brief Review of Problems and Enquiries with Part B Processes

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Since its publication in 1993, HMIP Guidance Note D1 - Guidelines on Discharge Stack Heights for Polluting Emissions - has been widely used by local authorities for calculating stack heights for short term exposure to almost any type of polluting emission from Part B processes regulated under the Environmental Protection Act 1990. It has generally proved very successful in this role. A brief review of enquiries received from local authorities on its use is given here as an indicator of common problems with Part B processes. A revised version of the document will shortly be prepared in order to update some aspects and correct a number of minor errors and omissions. This will be accompanied by a spreadsheet to assist carrying out the calculations.

Introduction

With the introduction of the *Environmental Protection Act 1990*, almost all polluting emissions to the atmosphere were brought under some form of regulation and control. Larger plant and the more complex processes (Part A processes) remained, as before, under the control of HM Inspectorate of Pollution (now the Environment Agency) and became regulated for Integrated Pollution Control under Part I of the Act. The authorisation of smaller processes (Part B processes) became the responsibility of local authorities, being regulated for air pollution control also under Part I of the Act. The list of Part B processes, in particular, included a large number of process and combustion emissions which had previously been subject to little or no control and thus became formally regulated for the first time. To deal with this mass of new regulation, Process Guidance Notes were issued for most of the common processes; these laid down minimum standards of operation and set maximum emission limits for discharges to the atmosphere. The other feature of regulation of

discharges to the atmosphere - the determination of stack heights adequate to limit pollutant concentrations at the ground - was covered by a separate document, HMIP Guidance Note D1, *Guidelines on Discharge Stack Heights for Polluting Emissions* (HMIP, 1993); this laid down, for the first time, a systematic procedure for calculating stack heights for short term exposure to almost any type of polluting emission. The first Process Guidance Notes (PG Notes) and Guidance Note D1 were produced around the same time; more recently the PG Notes have been passing through their four year reappraisal cycle, during which any initial problems have received attention.

This new structure for dealing with the smaller polluting emissions under the EPA has generally worked very well. There have, inevitably, been some difficulties experienced by the local authority officers in dealing with a new system of appraisal and authorisation of a wide range of polluting emissions. However, these have been relatively few in number considering the scale of the new authorisation process. The use of Guidance Note D1 for

determining stack heights has also generally operated fairly well and it has become an accepted tool for the purpose. It is in very wide use, with more than 3000 copies presently in circulation. As with the PG Notes, there have been some initial problems, but these have mainly been relatively minor and no major difficulties have arisen in its use.

The main need has been for additional guidance on matters not covered adequately in the original document. In view of its all-embracing range of application, it was not practicable to cover details of application of the guidance to every conceivable situation and because of the constraints on its production, the original document specifically excluded its use for odorous discharges and in conditions of severe topography. A certain amount of additional guidance has therefore been issued. A background report on Guidance Note D1 (Hall and Kukadia, 1995) described in detail the philosophy and technical content of the document. Two additional publications dealing with odorous discharges (Hall and Kukadia, 1994; Woodfield and Hall, 1994) cover the best, though imperfect, advice on this complex subject that can be offered. There have also been two publications dealing with other subjects: the first covered low velocity stack discharges and the correction of stack heights to account for the resultant loss of plume rise (Hall, 1995a); the second dealt specifically with stack heights for VOC emissions, covering problems of both odour and toxicity (Hall, 1995b).

Some Notes on Enquiries

In order to deal with any problems arising during the use of Guidance Note D1, we have operated an advisory service for the last two and a half years which has been free to local authorities. This service has been provided on behalf of the Air and Environment Quality Division of the Department of the Environment, Transport and the Regions (DETR, formerly DOE), whose remit includes a responsibility for local authority activities over Part B process authorisations. The details of these enquiries have been logged and an approximate breakdown is given below in order of frequency. Table 1 lists the processes involved and Table 2 the type of problem.

Total numbers for the two lists are not the same. Enquiries may be about a particular process, or about a particular type of problem as well as specific cases involving both. The total number of individual enquiries has been about 175. The “miscellaneous processes” cover a wide spread of types, including animal feed production, cloth and metal coating, galvanising, compact disc manufacture and sewage sludge drying.

Though not a representative record of every application of Guidance Note D1, the breakdown of enquiries does provide a microcosm of the most frequently occurring pollution problems and those causing the greatest difficulty in authorisations. To some extent the number of enquiries

on specific processes has followed the timetable of first authorisations for specific processes and their related PG Notes. However, some processes and types of pollution problem clearly predominate. The processes in the top half of Table 1 have been subjects of concern for many years. Of these, the number of enquiries for conventional heating and steam raising plant are relatively small considering the very large number of installations. This type of plant is largely straightforward to deal with and is covered by a separate guidance document (Third Edition of Memorandum to the Clean Air Act, DOE, 1981). Similarly the upper half of types of problems listed in Table 2 have been common topics over many years. The number of direct enquiries over the use of Guidance Note D1 is relatively small considering the scale of its application and the number of copies in circulation, though this includes only specific enquiries of this sort rather than those additionally associated with particular problems. Apart from this item, the two remaining most common types of problem - odour and dust/particles/deposition - are the major causes of nuisance complaint. Besides their frequency, this prevalence is partly due to the fact that they are directly perceivable by the human senses. The remaining items on the list are essentially problems of a technical nature which the present Guidance has not covered very thoroughly.

Table 1

<i>Process</i>	<i>No. of Enquiries</i>
Paint spraying	16
Cremators	16
Vehicle respraying	15
Conventional heating/steam raising plant	15
Foundries/cupolas	13
Wood/paper/straw burning	8
Roadstone coating	7
Incinerators/thermal oxidation plant	6
Mining/quarrying	7
Printing	3
Tanning/leather processing	3
Miscellaneous processes (2 items or less of any type)	25

Table 2

<i>Type of Problem</i>	<i>No. of Enquiries</i>
Odours	46
Regulatory/interpretation of application of D1, guideline concentrations	30
Dust/particles/deposition	15
VOCs and compliant coatings	14
Process discharges	11
Low stack discharge velocities	8
stack design	8
Effects of topography	7
Effects of trees/foliage	3
Dispersion modelling	3

Discussion and Conclusions

It would appear from the two lists that the most commonly occurring pollution problem is that of odours, specifically from spray painting and vehicle refinishing but also of odours more generally. The use of compliant coatings in spray painting has relieved odour problems to a limited extent, but these will not completely supplant the use of organic solvents in the foreseeable future and are not without problems of their own. There remain deficiencies in the research base in this area which make odour problems difficult to handle with great certainty and this leads to inevitable conservatism in the determination of stack heights and in the related need for specifying abatement equipment. The two reports offering guidance on odours noted previously review the problems and cover the best advice that it is presently practicable to offer. There is currently no research or other work in progress known to the author that is likely to significantly alleviate this position in the near future.

A feature that has arisen in many of the enquiries is the lack of generally available background data or reviews on many processes, over that available in the PG Notes, and which can provide additional understanding in guiding decision-making over Part B processes. The PG Notes offer carefully considered information on specific processes, the major emitted pollutants, emission monitoring requirements and other critical regulatory features. However, because they are the principal regulatory process control documents they are essentially legalistic in nature and offer only limited discussion and description of the processes involved. Most local authorities are unlikely to have more than one or two examples of a specific process within their area, so that the opportunities for learning about specific processes is limited and there is a need for more general advice. BRE's advisory service has to some extent covered these needs, but additional written guidance, in the form of a more general discussion of specific processes and reviewing different options for process techniques and abatement methods would be of great value. The report on VOC emissions (Hall, 1995b) is an example of this sort of more general review.

Large Scale Figures for Guidance Note D1

Those who still prefer the graphical methods of estimating stack heights may like to know that the originals of Figures 1-4 in the Guidance Note were originally prepared to a larger scale than they appear in the document. In particular, Figures 2 and 4 for estimating the uncorrected stack heights, were prepared at A3 size so that they could be used to an accuracy of 1m. HMSO were not, unfortunately, able to reproduce them at this scale in the final document. BRE is, however, happy to supply copies of the originals on receipt of an A4 sized stamped, addressed envelope.

Though Guidance Note D1 has proved very effective in its application, its use over its first few years has revealed a number of minor errors and omissions. Also some parts of the advice, some values of the Pollutant Guideline and Background Concentrations, for example, are in need of revision. One of the greatest problems for many users has been in carrying out the calculations. The Guidance Note provided a graphical method of calculation as well as the basic formulae. The former is quick and easy to use with a little practice and very useful for design purposes where a variety of stack heights may need considering. However, calculations using the basic formulae are generally preferred for authorisations. These, though mathematically straightforward, are not very user friendly and are better suited to a small computer programme or a spreadsheet application. Several of these have been produced by interested parties, but pose problems for authorisations. It cannot be assumed that they are correct (the author has found errors in a number of them), so they must be checked, and most cover only a limited part of the options in the Guidance Note. Following consultation with both DETR Air and Environment Quality Division and the Environment Agency, it has been agreed that a revised edition of Guidance Note D1 will be produced in the near future. This will not alter the basic method of calculation. It has also been agreed that the revised edition will be accompanied by a spreadsheet for the calculations. This will provide a common basis for calculation readily recognisable by all parties, and which can be easily checked. It will also effectively provide an application form for the process details and reduce some of the most common errors and deficiencies in applications.

In the longer term there are a number of matters relating to stack height determination for Part B processes which deserve attention. There are significant deficiencies in the research database on this subject - many of these are discussed in the background document. Some other items pose immediate practical problems. Besides the problems of nuisance from odour and dust, there is presently no formal advice on handling the effects of topography on stack height determination. This was specifically excluded from the original document as being too complex to deal with within its scope. This problem affects only limited areas of the UK, but the effects can be severe when such problems occur.

Acknowledgements

The work described here has been funded by the Air and Environment Quality Division of the DETR as part of its responsibility for Part B processes under the *Environmental Protection Act 1990*.

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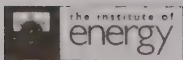
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UPDATE

ENVIRONMENTAL STATISTICS

The annual *Digest of Environmental Statistics* was published in July providing data on national pollutant emissions and the main sources of emissions. Reference is made to national, European and international commitments and targets.

The Global Atmosphere

Emissions of **carbon dioxide** totalled 148 million tonnes in 1995 - 11 million tonnes lower than in 1990, thus meeting the UK's commitment to reduce emissions to their 1990 level by 2000. Power stations (30%) and road transport (20%) were the main sources of emissions.

In 1995, emissions of **methane** were 15% lower than in 1990 at 3.8 million tonnes. Main emitters were landfill (46%) and cattle (21%).

Manmade emissions of **nitrous oxide** in the UK were estimated to be 95,000 tonnes in 1995, 21% lower than 1990. Non-combustion processes accounted for 67% of total emissions.

Air Quality

Sulphur dioxide emissions at 2.4 million tonnes in 1995 are 52% below their 1980 level and have thus already exceeded the 50% target by 2000 agreed under the UNECE Second Sulphur Protocol; emissions from large combustion plant were 55% lower than in 1980 - i.e. 15% lower than the 1998 target set in the Large Combustion Plant Directive. "Poor" air quality in respect of SO₂, based on DOE criteria was recorded at 14 of 28 UK monitoring sites on at least one occasion in 1995. "Very poor" air quality was recorded at Belfast East (17 hours on 5 days).

Total black smoke emissions decreased 12% in 1995; emissions from road transport have fallen by 18% since their peak in 1992 and now constitute around 50% of all emissions.

Emissions of smaller **particles (PM₁₀)**, fell by 14% between 1990 and 1995; road transport and non-combustion processes are the major sources, accounting for around half of total emissions. Exceedances of the UK standard of 50 µg/m³ for PM₁₀ were recorded at all automated urban monitoring sites in 1995.

UK emissions of **nitrogen oxides** decreased 5% in 1995, and are 9% lower than their 1987 level (the UNECE NO_x Protocol required a freeze on emissions by 1994 based on 1987 levels). Emissions from large combustion plant are 45% lower than in 1980 - an improvement of 15% over the

LCP Directive's 1998 requirement. Road traffic emissions accounted for 49% of total emissions in 1995 but have fallen steadily since 1989, mainly as a result of the introduction of catalytic converters in cars.

"Poor" air quality for **nitrogen dioxide** was recorded on at least one occasion at 15 of the 29 national monitoring sites in 1995 - all 15 were urban sites.

Carbon monoxide emissions decreased 8% in 1995; emissions from road transport, which were the source of 75% of all emissions in 1995, have fallen by 28% since 1989, again mainly as a result of the introduction of catalytic converters.

VOC emissions in 1995 decreased 4%; solvent use and road transport, 30% each, were the main sources of emissions in 1995.

"Poor" air quality as a result of **ground-level ozone** concentrations, was recorded at 22 of the 32 monitoring sites on at least one occasion in 1995. Ten of the 22 sites were urban sites, but most frequent exceedances occurred at rural sites: 98 hours on 14 days at Lullington Heath; 66 hours on 15 days at Yarner Wood; and 54 hours on 12 days at Harwell.

Noise

The number of **noise** complaints per million people made to environmental health officers from all sources in England and Wales rose by 22% between 1993/4 and 1994/5. In 1994/5 complaints about noise from domestic premises accounted for about two-thirds of all complaints about noise received by EHOs in England and Wales; complaints about noise from this source increased by almost 300% between 1983/4 and 1994/5.

Waste

Around 414 million tonnes of **waste** is produced annually in the UK - 21% from mining and quarrying; 19% from agriculture; 17% from demolition and construction; 16% from industrial processes; and 7% is municipal waste (including household waste). **Landfill** continues to be the most widely used method of disposal for municipal waste, accounting for 83%. About 1.5 million tonnes (6%) of household waste was collected for **recycling** or **composting** during 1995/6.

The *Digest of Environmental Statistics*, No. 19, 1997 is available from the Stationery Office, ISBN 11 753399 8, price £30. A free booklet, *The Environment in Your Pocket 1997*, which presents around 60 of the key data series in the

Digest, is available from the DOE Publications Despatch Centre, London SE99 6TT, tel: 0181 691 9191; fax: 0181 694 0099.

The text and tables of Digest No. 19 and *The Environment in your Pocket 1997* will be available on the Internet/WWW in the autumn, address: <http://www.open.gov.uk/doe/doehome.html>

NIGHT TIME NOISE

The night-time noise nuisance provisions of the *Noise Act 1996* were brought into force on 23 July. Local authorities which adopt the relevant provisions of the Act will be able to issue a warning notice to perpetrators of noise which exceeds the permitted level coming from dwellings between 11.00 pm and 7.00 am the following morning. If the noise continues after a time specified in the warning notice, the offender will become liable to prosecution; alternatively the local authority officer may issue a fixed penalty notice which is payable within 14 days. Where a warning notice has been served and the noise continues, local authorities may take action to remove the noisemaking equipment.

The permitted level has been set in Directions issued by the Secretary of State on 23 July 1997. This is 35 dB where the underlying level of noise does not exceed 25 dB, or where it does exceed 25 dB, 10 dB above the underlying level.

See also NSCA news section for a summary of NSCA's 1997 noise survey.

Noise Circulars

The Department of the Environment, Transport and the Regions have published (July 1997) two circulars relating to recent noise legislation. These are:

- Environment Circular 8/97 (WO 41/97): *Noise Act 1996*.
- Environment Circular 9/97 (WO 42/97): *Noise and Statutory Nuisance Act 1993*.

AIR QUALITY STRATEGY

Environment Minister Michael Meacher has announced that regulations implementing the National Air Quality Strategy will be set in place before the end of 1997. The Regulations will give legal status to the Strategy's air quality objectives. Local authorities will then be able to review and assess their air quality as required by the *Environment Act 1995* and take action where objectives are at risk of being breached.

Mr. Meacher also announced that a review of the Strategy will begin immediately (instead of in 1999) with a view to producing conclusions by the end of 1998; the review will look at every aspect of air quality policy: pollutants and their effects, policies for reducing them, the role of transport, industry and local authorities, the costs of

abatement etc. The review will also consider the feasibility of bringing forward the 2005 target date for meeting objectives.

HEALTH OF THE NATION

The proposal to include environment as a key area in the Health of the Nation Strategy is not to proceed (see *Clean Air*, No. 2/1997 & No. 3/1997). In outlining Labour's Public Health Strategy, Environment Minister Michael Meacher said that instead there would be more emphasis on the factors that contribute to poor health, such as poor and damp housing.

NEW ISO ENVIRONMENT GUIDE

ISO Guide 64, *Guide for the inclusion of environmental aspects in product standards* outlines the relationship between product standards and the environment. The purpose of the Guide is to raise awareness amongst standards writers that provisions in product standards could have a significant influence on the extent of environmental impacts. Environmental concerns include climate change, ozone depletion and habitat alteration. When addressing such issues, the Guide advises standards writers to call upon the expertise of specialists.

Recognised scientific techniques, including lifecycle assessment, are recommended in the Guide and it offers some general considerations that should be taken into account when developing product standards.

ISO Guide 64, which reinforces the ISO 14000 series of environmental management standards, is available from the British Standards Institution Customer Services, tel: 0181 996 7000.

REDUCING STAFF TRAVEL

The Countryside Council for Wales has recently started to use video-conferencing to minimise the need for staff to travel to meetings, particularly between offices. Investing in video-conferencing links between CCW offices in Bangor, Aberystwyth, Cardiff and Newtown and the Joint Nature Conservation Committee (JNCC) in Peterborough is expected to bring a saving of over £60,000 in the first three years in CCW's running costs.

OILSEED RAPE - A CAUSE OF ALLERGY?

A recent report from the Institute for Environment and Health at Leicester University finds little scientific evidence to show that oilseed rape is responsible for widespread adverse health effects, although it may cause problems among people who are already sensitive to other pollens.

The report, commissioned by the Home-Grown Cereals Authority and MAFF, looked at the many ways in which oilseed rape could cause ill health; these included the release of pollen and VOCs (produced by many types of plant and responsible for the smell of flowers, amongst

other things), the pesticides associated with the crop and the presence of fungus growing on the plants.

The report suggests that many of the health problems blamed on oilseed rape may be caused by allergies to pollen from other plants, although the evidence in some cases is patchy - there is thus a need for more information about the symptoms reported by people living near oilseed rape fields, and about how other factors such as other pollens and air pollution may affect them, as well as oilseed rape itself. The IEH says that while there is currently no direct evidence that VOCs produced by the plants have any effect, this does merit further investigation.

The *IEH Assessment on Oilseed Rape, Allergenicity and Irritancy* is obtainable from the IEH, 94 Regent Road, Leicester LE1 7DD, price £12.50.

NATIONAL GRID COMMUNITY 21 AWARDS

A new award scheme to help local authorities in England and Wales finance community projects which improve the social, economic and environmental quality of life in their areas was launched in July. The awards are being run by the Local Government Management Board and the UK Local Agenda 21 Steering Group in partnership with National Grid.

To be eligible projects must be new schemes or developments of existing schemes and address sustainability concepts such as efficient use of resources, the promotion of good health for all, access to education and employment, and caring for nature. Open to local authority schemes being run in partnership with groups such as schools, youth and residents' associations, the awards will go to initiatives judged to be of most benefit to the local community. Applications must come from local authority Local Agenda 21 coordinators.

The awards, of up to £5,000 each, have been devised to support the Local Agenda 21 programme, being promoted by local government in response to Agenda 21, the worldwide plan for sustainability agreed at the Rio Earth Summit in 1992.

For more details of the awards, contact Nadir Meerza or Sarah Dennis at the National Grid Community 21 Awards Office on 01727 850761. The closing date for this year's entries is 30 September.

OPENCAST COAL MINING

Measuring Health Effects

In the March/April 1997 issue, Clean Air reported on a study being carried out by Torfaen County Borough Council to assess the effects on their health to people living close to opencast coal extraction sites. As part of the study Torfaen CBC hosted a seminar in June which brought together delegates from university research, environmental health, planning, community groups, public health and the mineral industry.

Dr. Tanja Pless-Mulloli from the University of Newcastle (which designed the Torfaen study) described the design of her Department of Health-funded study into the health effects of small particles arising from opencast coal extraction; she explained the importance of matching communities for socio-economic indicators in order to control for confounding factors.

Paul Reynolds (City of Sunderland) discussed the local authority role and considered opencast coal mining in the context of local and the UK National Air Quality Strategy and he described the current means of control open to local authorities. Duncan Smith (Torfaen CBC) explained how environmental assessment allows a local authority to undertake a formal, methodological assessment of environmental impacts.

Dr. Georgina Soulby (Leeds Community and Mental Health Services Trust) used the example of a potential opencast extraction site near her home to illustrate community concern and how such sites could impact on the health and well-being of local people. She looked at the effects of air pollution, noise, accidents, long term and psychological effects, and cumulative and combinations of effects.

Other speakers addressed the following:

- Dust monitoring for research - the use of pollution profiling in the assessment of sources;
- The significance of airborne particulate characterisation for enhanced fugitive emissions monitoring;
- Size segregated particle measurements by chemical species and their impact on health;
- The West Glamorgan asthma and air pollution study - design and logistics.

For further details of the study and of the availability of all papers presented at the seminar, please contact Ms Jacqui Tate at Torfaen CBC on 01495 766429, or Fax 01633 648463.

FROM WASTELAND TO WETLAND

The Lomeshaye Marsh Project

This article results from a recent visit to the Lomeshaye Marsh Project by NSCA's North West Division.

The Lomeshaye Marsh Project is an off-site project now managed by the Lancashire Heritage Trust and project volunteers. It was originally the inspiration of employees of Mitre Printing Co. Ltd, based on Lomeshaye Industrial Estate. The employees had used the site as an informal nature reserve and were sufficiently alarmed by the rapid expansion of the industrial estate to ask for the help of the local Friends of the Earth group. The resulting coalition, formed in 1993, which was greatly aided by local residents at Lomeshaye village, campaigned to have the wetland and surrounding area (formerly the site of the Barrowford Sewage Treatment Works) excluded from the industrial allocation.

The wetland and surrounding scrubland, which is classified as a biological heritage site, supports approximately 120 species of plant, more than 40 bird species, including rare winter visitors such as snipe and jack snipe, and a thriving amphibian population of frogs, toads and smooth newts. A series of clean-ups, pond digging, planting, coppicing, footpath construction and, most recently a woven willow hide for birdwatchers have transformed the site over the past three years. Several new ponds have been created to extend the wetland which has had a major effect on the invertebrate populations, as well as encouraging birdlife. Oak, rowan, willow and alder have been planted to form a shelterbelt to the east of the site.

Clay excavated from the scrapes and ponds has also found a use: an embankment has been built and trees coppiced from the streamside have been laid between willow posts to form a dead hedge. Most of the willow posts have since sprouted, however, and will provide a living fence along which a mixed hedgerow will be planted to increase the variety of habitat available. This scheme is typical of the group's commitment to minimising waste and maximising resources.

The project has had invaluable support from Rural Action, the Mersey Basin Trust, BTCV, English Nature, the Environment Agency, North West Water, Pendle BC, Pendle Re-Employment Service, Lancashire CC, Nelson & Colne College and the Lancashire Wildlife Trust. Pendle Friends of the Earth, Green Space, Friends of Pendle Heritage, local schools, Pendle Civic Trust and the Probation Service have also been closely involved, lending a hand with the many tasks created by the project. It is also

hoped that this project will encourage more environmental awareness amongst other firms resident on the estate and promote greater contact with programmes such as Water Watch and Stream Care which offer practical solutions to waste control.

The Lancashire Heritage Trust and Lomeshaye Marsh volunteers are working to gain a reputation for best practice in conservation and sustainable development, and will liaise with any group with similar aims. The Project aims to put the principles of Local Agenda 21 into action by working with local voluntary sector groups to improve environmental awareness in the community and to provide an example of best practice as a working model for other industrial estates.

The Lomeshaye Marsh volunteers were named the Grimewatch "Best Community Project in 1994 and 1995, and were runners up in 1996 and 1997; they were awarded a Certificate of Merit in the Whitbread Volunteer Action Award 1995 and have been given £5,000 by the Body Shop on the basis of their future plans and the hard work already carried out. The project has also been shortlisted for an award by the Community Council of Lancashire in its 1997 programme.

For more details of the Project and their future plans for extending the project's potential as an educational resource and for building a visitor centre, providing maximum access for all sectors of the community, contact the Lomeshaye Marsh Project Officer, Judy Yacoub, tel: 01282 695366, ext.17; Fax: 01282 611718.

MEMBERS' NEWS

Members! Are we covering your news?
Please check that your press office has *Clean Air* on its mailing list.

A partnership including **Leicester City Council** and **De Montfort University** is aiming to achieve a reduction of 9% in domestic carbon dioxide emissions in Leicester, thanks to a new programme called Energy Sense. It is designed to encourage 15,000 households to halve their energy use by the year 2000. The project offers free energy audits and a discount card for energy-efficient goods and services.

A new Combustion and Processing business group has been formed at **CRE Group**. Using CRE's test plant, which includes a fluidised bed combustor, briquetting plant and carbonisation equipment, the group provides services related to boiler systems, smokeless fuels and waste combustion.

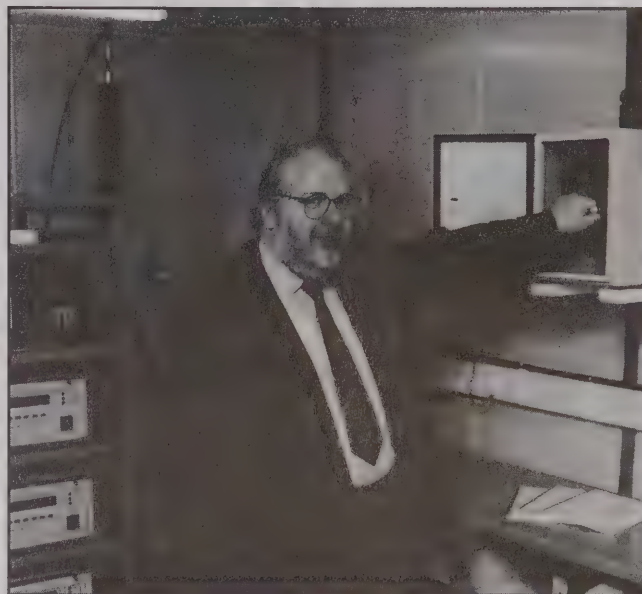
Stanger Science and Environment have been awarded a DOE contract to carry out a study on ultra-fine particles. The current air quality standard for particles is set for PM_{10} , but researchers suspect that smaller particles are mainly responsible for health effects. Stanger will monitor the relationship between PM_{10} and an even smaller fraction known as $PM_{2.5}$ at three sites in London. Stanger have also appointed Steve Bedford as their new marketing director.

After a long battle with the Motorway Widening Unit, **Luton Borough Council** has decided to fund its own air quality station near the M1 in order to monitor the air quality impact of widening the motorway. The Council has been pressing the MWU to undertake their own studies, but they have refused. "Good quality real-time information should be obtained on air quality in Luton so that trends in air quality can be identified and the effect of the widened motorway established", according to the Council's fifth annual review of environmental quality.

All of **Johnson Matthey's** work on fuel cells - including research, developments, production and marketing - has been brought together in a new department headed by Dr Jack Frost. Fuel cells use catalysts to produce electricity for automotive power and local electricity generation, and are pollution-free at the point of use. JM believes that they have the potential to become a significant part of their business.

The Marylebone Road air quality monitoring "supersite" was opened recently by Councillor Toby Harris (below), Chair of the Association of London Government.

Run by the **South East Institute for Public Health**, the site will monitor a range of pollutants, plus traffic congestion and weather conditions. "The answer to improving air pollution lies in a London-wide coordinated approach - it may well be an issue that the Greater London Authority could take on board" said Cllr Harris.



Britain had 82 chemical plume "alerts" last year, according to **The Met Office**. Weather plays an important part in the dispersion of toxic dust and gases, and the Public Met Service Unit is often called in to predict the path of chemicals released from incidents. Prediction of ambient temperature is also important for spills of liquids which vaporise easily. Apparently the Leeds Weather Centre area handled the most requests - 34, in comparison with just seven in Scotland.

Croydon Council has been using new powers under the Noise Act to confiscate equipment from persistent noise offenders. Cllr Maggie Mansell is pictured (page 150) with some of the seized equipment. She says: "Noise is one of the major causes of disputes between neighbours, especially loud music. We will prosecute and ask the Court to enforce the power of forfeiture if all else fails."

The largest solar power installation at any manufacturing site in Europe is under construction at the **Ford** engine plant in Bridgend. Funded by Ford, the EU and the DTI, the scheme involves 25,000 square metres of roof-mounted photovoltaic panels, which will provide all the lighting requirements for the building beneath.

Divisional News

The **South East Division** held its AGM at Guy's Hospital in May and re-elected the following: Cllr F John Smith Chairman, Paul Cooney Deputy Chairman, Joe Beagle Honorary Secretary and George Vulkan Hon Treasurer. John Boddy and Paul Symonds stood down from the Divisional Council. The meeting heard from Rob Gibson of LB Hounslow about the environmental problems associated with modern airport developments. A joint meeting with South East Institute for Public Health on sustainable transport options for the South East is planned for 12 November.



The **North West Division** visited the Lomeshaye Marsh Project at its meeting in June. Members were so impressed with the work that they asked the Project Officer to write a short article for *Clean Air*. (see p147)

Members of the **East Midlands Division** will be sorry to hear the very sad news that Joe Storer died on 16 July. Joe was a past Chairman of the Division, and had recently been awarded a Certificate of Commendation on his retirement from South Derbyshire DC. On a happier note, the Division's AGM saw a presentation to Jane Inglefield, in recognition of 23 years service to the Society. Jane is pictured below, flanked by Richard Mills, David Romaine and Ken Williams. The AGM elected Allan Brown, Bill Dunn, Nigel Tranmer, John Milnes and Ken Williams to the NSCA Council. Ken Williams was also elected to be the Division's representative on the proposed Board of Trustees.



Elsewhere...

Transport Minister **Gavin Strang** has obviously been reading his political history books. Announcing that the Government is strongly committed to an Integrated Transport Policy, he admitted that this had also been a key objective for a previous administration. The 1945 Labour Government, to be precise.

Leeds City Council's Cleaning and Services Agency has received accreditation under the environmental management standard ISO 14001. In reviewing the environmental impact of its activities, the Agency has developed policies designed to save electricity, dispose of dirty fluids safely, use the correct concentrations of cleaning chemicals and, touchingly, "to avoid injury to small mammals like hedgehogs when using strimmers".

The Environment Agency has given the go-ahead for power stations to burn cattle culled under the BSE slaughter programme. This raises the possibility of other interesting sources of energy. The latest meeting of the Investigation of Air Pollution Standing Conference spent an entire morning on the prospects for burning **Pet Coke**. Sensitive readers will be glad to hear that this is a by-product of the oil industry, and does not represent any threat to veterinary incinerator operators.

Finally, a briefing paper from the ESRC Global Environmental Change Programme at the University of Sussex alerts us to the fact that "millions of people now suffer intellectual decline because of human-caused environmental change." This could explain a lot. Admitting that "there are no comprehensive statistics" on the subject, the paper nonetheless declares a new syndrome: **Environmentally-Mediated Intellectual Decline**, or EMID for short. Apparently "EMID could precipitate regressive brain evolution". Clearly urgent action is called for, but we can't quite think what...

BOOKS & REPORTS

Climate Change and the Energy Sector - Vol 1 The European Union. D. Anderson, M. Grubb & J. Depledge. *Financial Times Energy Publishing*, 1997. £350, ISBN 18533437140.

This report summarises the national climate change programmes of the EU member states and the EU. An overview of EU policy is followed by examination of energy and industrial sectors and climate change programmes in the individual member states. It sets them in the context of national energy policies and related debates. The aim of the report is to assess the impact of existing and possible climate change policies, particularly on the energy sector and greenhouse gas emissions. Subsequent reports will examine the climate change programmes of non-EU OECD countries, followed by central and eastern European policies.

Green Commuter Plans - London Boroughs' Progress. D. Hurdle, Y. Rajesparan. *Centre for Independent Transport Research in London*, May 1997. £10.00.

This report presents the results of a survey of progress in London's 33 local authorities in introducing Green Commuter Plans. It emphasises the leading role councils must play in implementing their own green transport policies if they are to expect others to follow. The survey found that of the London councils, only one already has a plan, but 16 are preparing one. None have car sharing schemes, but cycling allowances are widespread, and over one-third of authorities are experimenting with alternative vehicle fuels. It provides information on ideas, proposals and action elsewhere that may be useful for councils, and gives a list of recommendations to London local authorities - which should be applicable to authorities throughout the country.

Combined Register of Health, Safety and Environmental Professionals. *Institution of Chemical Engineers and Royal Society of Chemistry*. 1997. ISBN 1870343441. Available free from Sue Barnett, IChemE, 165-189 Railway Terrace, Rugby CV21 3HQ.

The register lists members of IChemE and RSC who have demonstrated necessary in-depth knowledge and experience of their specialist area of work. It is intended to assist non-specialists in identifying practitioners and provide a source of competent specialists who are subject to the professional body's code of conduct.

Vital Travel Statistics. Stephen Potter. *Landor Publishing*. 1997. £19.50. ISBN 1899650105.

With traditional supply led transport planning no longer deemed sustainable, transport now needs to be subject to demand management. This report aims to identify trends on which new policy decisions can be based. It utilises a statistically focused exploration of current transport problems, covering travel and transport trends, changes in travel patterns, transport policy, vehicle ownership and land use and demographic change. In view of the 'mobility explosion' of the last forty years, it aims to enhance understanding of travel trends and behaviour.

Hydrogen Power (The commercial future of the 'ultimate fuel'). David Hart. *Financial Times Energy Publishing*, 1997. £195.00 ISBN 1853347604.

Hydrogen is abundant in supply, highly reactive and therefore applicable in many combustion processes. This report looks at the practical and economic feasibility of hydrogen as an energy source. It gives the history of hydrogen as a fuel and in power generation. Chapters cover storage and distribution, technologies, safety, environmental impact, and policies. The report concludes that in the short term hydrogen is not competitive, but in the long term it will be an important source of energy.

The Law of Nuclear Installations and Radioactive Substances. S.Tromans, J. Fitzgerald. *Sweet and Maxwell*, 1997. £95.00. ISBN 042153880.

With the reorganisation of the nuclear industry following privatisation, and changes as a result of the *Environment Act 1995*, the law relating to nuclear installations is complex. This book covers issues underlying regulatory controls of nuclear activities, licensing of nuclear installations in the UK, liability and insurance issues affecting nuclear installations, registration of radioactive substances, law and policy relating to radioactive waste and the text of the *Nuclear Installations Act 1965* and *Radioactive Substances Act 1993* (including amendments made by the *Environment Act 1995*).

FUTURE EVENTS

27 SEPTEMBER - The Fuming Mad Rally

Mass rally, organised by Friends of the Earth, Plaid Cymru, the Green Party, the Townswomen's Guild and the National Asthma Campaign, to call on the Government to support the Road Traffic Reduction (UK Targets) Bill.

Venue: Trafalgar Square, London.

Details: Road Traffic Reduction Bill Campaign, c/o FOE, Tel: 0171 490 1555, ext.1414.

15 OCTOBER - Emission Monitoring

One day CIEH course (in association with NETCEN) on abatement systems and authorisation writing for subscribers to Emission Monitoring Package.

Venue: Manchester.

Details: June Balfe, CIEH Events Division, Tel: 0171 827 5859; Fax: 0171 827 5868.

20-21 OCTOBER - The IPPC Directive

What the IPPC Directive means for business - both those already subject to IPC and those that will be affected by the new regime.

Venue: Claridges Hotel, London.

Details: Tiffany Goubard, IBC Conferences, Fax: 0171 631 3214.

3-4 NOVEMBER - Controlling Industrial Emissions

Practical experience from operating process plant, in particular the increasing importance of an integrated approach towards the management of emissions to the environment. Co-sponsored by Institute of Energy, Institute of Physics, NSCA and IMechE.

Venue: Commonwealth Institute, London.

Details: Julie Morgan, IChemE, Tel: 01788 578214; Fax: 01788 577182.

10 NOVEMBER - Transport and the Environment

NGO conference linked to the UN-ECE Regional Conference taking place on 13/14 November, enabling NGOs to prepare their own views on sustainable transport policies - see Update section of July-August 1997 issue of *Clean Air*.

Venue: Vienna.

Details: Gijs Kuneman, European Federation for Transport and the Environment, Fax: +32 2 537 7394.

20 NOVEMBER - Flexibility 97 - Wired Working in the Public Sector

One day conference exploring the impact of technology and new working practices on efficiency, effectiveness, people and the environment. Launch of Department of Transport study into teleworking and its impact on work related travel.

Details: Dorothy Woods, The Home Office Partnership, Tel: 01223 421911.

1998

18-21 MAY - Atmospheric Dispersion Modelling

Fifth international conference on harmonisation within atmospheric dispersion modelling for regulatory purposes.

Venue: Rhodes, Greece.

Details: John Bartzis, INTRP/Environmental Research Laboratory, 15310 Aghia Paraskevi Attikis, Greece; Fax (+30 1) 6533431; Email: 5sharmo98@avra.nrcps.ariadne.t.gr

FORTHCOMING NSCA EVENTS

Monday 20 - Thursday 23 October 1997 Environmental Protection 1997

NSCA's 64th Annual Conference and Exhibition
Glasgow

Tuesday 11 November 1997

UK Dispersion Model Users Group
Olympia 2, London

Tuesday 18 November 1997

Training Seminar - NEC Birmingham
Developing a Local Air Quality Strategy

Tuesday 10 February 1998

Training Seminar - NEC Birmingham
Implementing Air Quality Management

For list of forthcoming Divisional
meetings and events see page 125.

For further details please contact

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**ENVIRONMENTAL
PROTECTION 1997
GLASGOW
20-24 OCTOBER**





CLEAN AIR

AND ENVIRONMENTAL PROTECTION

November/December 1997

Integrated Pollution Prevention and Control

- BAT Definition & UK Regulatory Philosophy
- Prospects for a Level Playing Field
- Sustainable Industrial Production - The Dutch Approach
- UK Implementation - NSCA View

Volume 27

Number 6

**NATIONAL SOCIETY FOR CLEAN AIR
AND ENVIRONMENTAL PROTECTION**

NSCA FACT SHEETS

Fifteen detailed A4 information sheets.

1. Air Quality Standards

Air quality standards set by the EU, US Environmental Protection Agency, World Health Organisation and the UK.

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A summary of past and current emission levels of major pollutants.

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Information on the destruction of the ozone layer and the measures being taken to protect it.

4. Tropospheric Ozone

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6. Incineration

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An overview of the problem of low frequency noise.

9. Aircraft Pollution

A look at the legislation governing aircraft noise.

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50 copies of Factsheet No. 10 or No. 15, £10.00. Available from

NSCA, 136 North Street, Brighton BN1 1RG

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The National Society for Clean Air and Environmental Protection produces information, organises conferences and training events, and campaigns on air pollution, noise and environmental protection issues. Founded in 1899, the Society's work on smoke control led to the Clean Air Acts. More recently NSCA has been influential in developing thinking on integrated pollution control, noise legislation, and air quality management.

NSCA's membership is largely made up of organisations with a direct involvement in environmental protection: industry, local authorities, universities and colleges, professional institutions, environmental consultancies and regulatory agencies. Individual membership is also available to environmental specialists within industry, local authorities, central government, technical, academic and institutional bodies.

Members benefit from joining a unique network of individuals who share an interest in a realistic approach to environmental protection policy; from access to up-to-date and relevant information; from reduced fees at NSCA conferences and training events. They contribute to NSCA's regional and national activities; to environmental policy development; to translating policy into practice; to the Society's wide-ranging educational programmes.

NATIONAL SOCIETY FOR CLEAN AIR AND ENVIRONMENTAL PROTECTION (Founded 1899)

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South & Mid Wales Division: Robert West - Telephone: 01222 871142

1 Glynn Collen, Llandbradach, Caerphilly, Glamorgan CF83 3PP

IPPC

Integrated Pollution Prevention and Control

Most of this issue of *Clean Air* is devoted to a single theme - the IPPC Directive - a practice which we propose to follow from time to time on other major issues.

The choice of IPPC is timely. Whatever view is taken of the merits of the Directive, and the UK Government's proposals for implementation, it will undoubtedly set the framework for industrial emissions control in Europe for a good many years to come. Even more important, it is not a narrowly prescriptive piece of legislation; it gives wide discretion to individual Member States. There are therefore a large number of issues still open for decision on which the NSCA's voice should be heard.

At one level, the new Directive is a mirror image of the existing UK IPC regime - in its general philosophy, its definition of BAT, and its treatment of sectoral and local factors. But the Directive also offers wide opportunities for a step change in industrial pollution control through the incorporation of energy efficiency, noise, site restoration, and other factors not currently addressed in authorisations.

Given the flexibility of the Directive, and its similarity to current practice, it would be open to the UK Government to take a cautious, minimalist approach to implementation. It is to the Government's credit, therefore, that it appears ready to be bold, and to use the opportunities afforded by the Directive to review aspects of the current IPC system which are less than satisfactory.

There is also evidence that the Government may be willing to take a positive approach to the innovative features of the Directive, such as the incorporation of energy use and noise, and the links to remediation and aftercare. To accommodate the different positions of Member States, the Directive envisages a ten-year implementation period. The world to which IPPC must relate - and environmental policies themselves - is likely to change radically over such a period. This is not therefore an occasion to tinker, but an opportunity to set clear long term directions, on a basis which blends receptiveness to new ideas with the exceptional volume of experience of the UK on these issues. If approached in this way implementation of the Directive could radically enhance industrial pollution control in the UK.

Included in this edition of *Clean Air* is the NSCA's response to the consultation paper, which sets out fully both the key issues to be addressed and the conclusions which the Society's Council has reached on them. For the longer term, two themes may be particularly important. First, the Directive opens the opportunity to bring more closely together industrial emissions control and environmental management systems operated within industry. Creating this link is one of the most important priorities in the long term development of environmental protection policy, and it is important the opportunities which the Directive opens up to move in that direction should be taken.

Second, the requirements of the Directive could shift the balance of responsibilities between the Environment Agency and local authorities in industrial emissions control. The Society's view is that local authorities continue to have a key role to play in this field, although one which may need to evolve to take account of other developments.

This is the beginning of a long debate. As background to the Society's response, this issue therefore includes some of the key papers of enduring significance delivered at the joint NSCA/CBI conference at which the Minister announced his proposals. These cover the development of the UK regulatory system, the wider European implications, and some of the more radical approaches being developed in The Netherlands. These provide, in combination, an important input to public debate.

The IPPC BAT Definition and UK Regulatory Philosophy

Jim Skea and Adrian Smith
Science Policy Research Unit
University of Sussex

The requirements of the new IPPC Directive are superimposed on a British pollution regulation system which has been going through changes throughout the 1990s. On the one hand, the British integrated pollution control (IPC) system had an important influence on the development of the Directive. On the other hand, it has been hard to put the 'integration' principle into practice. The principle of 'best available techniques' (BAT) at the heart of IPPC is not far removed from the British BATNEEC principle currently operated by the Environment Agency. Among the major questions which remain to be resolved are: how emission limit values will be set; the degree of emphasis on uniformity as opposed to plant characteristics and local environmental conditions; and the implementation of the preventive approach which could stimulate the adoption of cleaner technologies. For the longer term, it is not clear how IPPC might be linked to the extended range of policy instruments (such as green taxes) which the EU aspires to introduce.

INTRODUCTION

The impact of the IPPC Directive (European Commission, 1996) on UK regulatory practice is subject to two types of uncertainty.

First there is the challenge of interpreting the Directive itself. The final text is the result of compromises between EU Member States with different traditions and practices. Inevitably, issues remain to be resolved as best available technique (BAT) notes are compiled at the EU level and as implementation takes place on the ground. How is a balance to be struck between the costs of measures and the advantages of higher standards of environmental protection? How can the impacts of industrial processes on the environment as a whole be assessed? To what extent will the regime be effects-driven (environmental quality standards) or technology driven? How can preventive (clean technology) approaches be implemented? How can waste avoidance and energy efficiency - already internalised to some degree in companies' decision-making - be taken into account?

In practice, most of these questions are relevant under any regime for regulating process pollution. This points to a second source of uncertainty. The British integrated pollution control (IPC) regime is far from settled. The regime was established by the *Environmental Protection Act 1990*. The first round of process authorisations between 1991 and 1996 achieved much by bringing 2,000 processes into the regime, building up a base of technical knowledge and stimulating the adoption of some basic measures. The Environment Agency and the Scottish Environment Protection Agency can cover most aspects of IPPC and take a view of the environment as a whole. This is not an advantage enjoyed by all EU Member States.

On the other hand, the 'best practicable environmental option' (BPEO) principle which was intended to put into effect the principle of integration across all environmental media has so far received little or no attention in many applications for authorisation (Smith, 1997). However, more attention has been paid in applications for new

processes and substantial changes. Guidance on BPEO assessments was published only in mid-1997 (Environment Agency, 1997). 'Flexibility', 'imagination' and 'expert judgement' - to quote directly from the guidance document - are expected to continue to play a role in British practice. This by itself raises questions as to how consistency will be achieved across different Environment Agency regions and for individual authorisations.

IPC gives Britain a head start in implementing IPPC. The language and philosophy of British regulation is reflected in many Articles of the new Directive. But there is more to IPPC implementation than interpretation of the Directive text. Implementation will be a long-drawn-out process. Under Article 5, existing processes need not be brought into the IPPC system for eight years. The development of BAT reference (BREF) notes and perhaps 'daughter Directives' at the European level will interact with implementation at the process level. Whatever policy framework is established, much work remains to be done to put the new philosophies of integration and prevention into practice.

This paper focuses primarily on the application of the 'best available techniques' (BAT) principle. It examines: first the role of the BAT principle in the IPPC Directive and its use in permitting procedures; and second the challenges facing process regulation in Britain. Finally, the paper brings these strands together to identify the challenges for IPPC implementation.

IPPC AND BEST AVAILABLE TECHNIQUES

BAT and BATNEEC

The principle of 'best available techniques' (BAT) is central to the IPPC Directive. In a sense, the Directive has moved closer to the British model by substituting the term 'technique', used in the *Environmental Protection Act*, for 'technology' which is used in the EU's 1984 Air Framework Directive. The Directive does not qualify BAT with a reference to 'not entailing excessive cost' (NEEC) which features in British legislation and in the Air Framework

Directive. However, a more careful examination of the meanings attached to the three words 'best', 'available' and 'techniques' shows that the distance between IPPC-BAT and UK-BATNEEC is likely to be so small as to fall well within the range of plausible interpretations.

- *techniques* in the IPPC Directive refer to both the technology used and the way in which installations are designed, built, maintained, operated and decommissioned. *This is almost identical to UK guidance* (Department of the Environment, 1997) *apart from the reference to decommissioning.*
- *available techniques* in IPPC are those which have been developed on a scale which allows implementation in the relevant industrial sector under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member States in question, as long as they are reasonably accessible to the operator. This is similar to UK guidance. Importantly, the consideration of 'costs and advantages' reflects UK current guidance on 'excessive costs' which is based on the principle that the costs of employing techniques should not outweigh the benefits. *The British concept of 'not entailing excessive cost' is effectively absorbed in the IPPC definition of availability.*
- *best* in IPPC means most effective in achieving a high general level of protection of the environment as a whole. This takes a somewhat different direction from the UK definition of 'best' which refers to techniques being effective in preventing, minimising or rendering harmless polluting releases. *The IPPC definition of 'best' captures the general aspiration to balance environmental impacts across different media embodied in the British BPEO principle.*

Permit Conditions

A particular feature of Article 9 of the Directive is the expectation that emission limit values will be included in permit conditions for all pollutants likely to be emitted in significant quantities. These limits should have regard for the potential for transferring pollution from one environmental medium - water, air or land - to another. The emission limit values could be supplemented or replaced by equivalent technical measures where appropriate.

A key issue is how emission limits values will be set. Here, the Directive leaves open a range of possibilities which can only be explored during implementation. The limit values should:

- be based on BAT, without prescribing specific techniques/technologies;
- take into account the characteristics of the installation concerned; and
- take into account geographical location and local environmental conditions.

At the same time, Article 18 of the Directive enables

the Council of Ministers to set generic emission limit values 'for which the need for Community action has been identified' as a result of exchanges of information between Member States and relevant industries provided for in Article 16.

This raises questions about the level at which environmental standard-setting will take place. Will technical detail be the province of the Council of Ministers or will responsibility go down as far as individual regulators operating at the local level? Who will BAT reference notes guide? National regulators with flexibility to interpret guidance or the Council of Ministers setting emission limit values in stone? How can European guidance notes reflect local needs in the way implied by Article 9?

The Directive leaves open exactly how the concept of 'subsidiarity' in process environmental regulation will be applied. Some Member States may prefer uniform emission limit values. Over the last five years, the UK has in practice exercised a more local form of control with individual Environment Agency inspectors and regions enjoying a considerable degree of discretion about the content of authorisation conditions and improvement programmes, especially in relation to existing and modified processes.

The Commission's proposals for revisions of the Large Combustion Plant Directive within the framework of the Acidification Strategy have already raised the issue of how emission limit values are going to be framed - by Directive or by the exchange of information and guidance.

BAT and Environmental Quality Standards

Article 10 of the IPPC Directive draws a distinction between permit conditions driven by BAT and those that might be driven by environmental quality standards. Environmental quality standards in this context are those established under EU legislation, e.g. air quality standards for substances such as sulphur dioxide and nitrogen oxides.

This is compatible with the Environment Agency's legal obligation to set authorisation conditions which ensure that such standards are met. However, the approaches to the relationship between environmental quality and the setting of emission limit values are subtly different. Under the IPPC Directive, environmental quality standards are a safety net should BAT principles not meet statutory obligations. UK guidance on BPEO assessment places environmental quality, in the form of environmental assessment levels, at the heart of the determination of BPEO. These environmental assessment levels might be derived from a range of sources, including WHO guidelines. At issue here is the balance between 'effects-based regulation' and classic 'best available technology' approaches which are often independent of specific local environmental circumstances.

PROCESS REGULATION IN THE UK

Practice and Philosophy

Regulation of industrial process pollution has gone through many changes in Britain over the last decade. Indeed, regulation has been renewed faster than many companies renew their process plant. Several persistent themes underlie these changes.

British regulatory tradition: British pollution control has traditionally been associated with flexibility, pragmatism (in contrast to what some have seen as Continental *dirigisme*) and informal negotiation between regulators and operators at the local level. At the inception of the IPC regime in the early 1990s, there was an overt attempt to move towards a more arms-length relationship between inspectors and companies. The strength of the British tradition, triggered by specific regulatory issues and the balance of resources (human and financial) available to HM Inspectorate of Pollution, saw the re-emergence of the more traditional approach from 1993 onwards. British regulatory tradition rests on two important pre-conditions: 1) non-intervention of the courts; and 2) a general absence of high-level political interest. Under these conditions, pollution regulation becomes a closed technical game played by companies and pollution inspectors. IPPC may serve once again to weaken this traditional approach, especially if Directives are used to establish uniform emission limit values. The changing relationship between the inspection body and the government, with the creation of the Environment Agency also heightens the possibility of more judicial review of procedures.

European context: Although British influence over IPPC is often cited in the UK, European legislation has been equally vital in shaping the current British regime. The need to implement the 1984 Air Framework Directive and the 1988 Large Combustion Plant Directive was a significant factor putting environmental protection on the parliamentary timetable in 1989-90.

De-regulation: The introduction of the British IPC regime ran in parallel with the de-regulation initiative. Reports from the Efficiency Scrutiny team in 1986 and the National Audit Office in 1991 saw the potential efficiency gains from a 'one-stop shop' approach to inspection as a major argument for introducing an 'integrated' approach to pollution control. This was probably just as important as the scientific rationale for an integrated approach covering different environmental media. The de-regulatory influence on IPC has continued - 35 of the 605 recommendations made by the Business Deregulation Task Forces in 1994 referred to IPC. Action which followed these recommendations led to significant reductions in the number of processes requiring authorisation and increased consultations with business over the implementation of IPC.

Credibility: While business has on the one hand been concerned about what it might see as excessively rigid regulation, it has also wanted pollution regulation that is credible to the wider public. The concept of a 'licence to operate' is central to several business initiatives, including *Responsible Care* in the chemicals industry. 'Complying with all laws and regulations' is a key component of many company environmental policies. Insensitivity to public concerns, often expressed at the local level, and inconsistencies in the application of procedures will weaken public support for the system of regulation - as has been the case recently in relation to the cement industry (House of Commons Environment Committee, 1997).

Implementing IPC

The British IPC regime has not yet settled down. The IPPC Directive adds new challenges for a regime which is far from maturity. However, many of the challenges posed by IPPC would need to be addressed in any event.

The application of BATNEEC principles in the authorisation of existing plant has been weak. The application of BPEO principles has been even weaker. This will continue to be a challenge as the BAT principle underlying IPPC is implemented.

The task of bringing 2,000 processes into IPC has been enormous. The finite resources available to HMIP, and later the Environment Agency, meant that little could be done in the first round of authorisations apart from bringing processes into the system, setting requirements for monitoring/data gathering and putting the more obvious measures into process improvement programmes. The re-authorisation of IPC processes which has now begun will be critical in establishing the effectiveness of the IPC system in delivering a truly integrated approach. This will coincide with the introduction of IPPC.

Notwithstanding the need to take account of geographical location and local conditions, there is a need to achieve consistency of approach in different regions and at different sites. The newly issued guidance on BPEO assessments provides consistent quantitative guidance for environmental assessment levels which can be used at all locations. However, the problem of indexing and aggregating different environmental impacts remains a controversial issue and one where there is a need to gain public credibility. There are evident public concerns in some localities about the "manipulability" of the Integrated Environmental Index (IEI) which has been proposed by the Environment Agency as a means of making BPEO assessments operational. Equally, some sections of industry are expressing growing concerns about negative public perceptions of their activities and consequent impacts on the direction and stringency of environmental regulation.

On the positive side, the introduction of IPC has been helped by - and has contributed to - the corporate 'greening' which has been a feature of the 1990s. There are potential

synergies between the preventive IPPC approach and corporate environmental management strategies. IPC has already strengthened the hand of many environmental managers. It has stimulated the collection of environmental or environmentally relevant information (e.g. mass balances) which has enhanced the capacity of companies to reduce pollution, waste and energy use - and hence costs.

Finally, the Environment Agency has begun to take a much more facilitating role with respect to company environmental performance. It has participated in 'clean technology' initiatives such as Aire and Calder, Project Catalyst and the 3Es project with Allied Colloids. This latter project has assessed the impact on process emissions, efficiency and economics of applying a culture of 'operator responsibility'. Significant emission reductions and financial savings opportunities have been identified. Such projects will inevitably enhance the Environment Agency's credibility and authority with companies, but care must be taken in distinguishing the facilitating and regulatory roles.

THE IPPC CHALLENGE

The twin challenges of bringing the British IPC system to maturity and integrating the additional requirements of the IPPC Directive are considerable. Fortunately, there is a distinct overlap between the two tasks, not least because the British approach had considerable relevance for the development of the European Directive. Nevertheless, several challenges lie ahead:

- determining means of blending formal analytical approaches (such as the Integrated Environmental Index) and 'expert judgement' (which features strongly in the recent BPEO assessment guidance) in order to enhance consistency of approach and credibility to the wider public. Finding appropriate means for making the integrated approach operational is the key. Expert judgement is particularly difficult to apply consistently since value-judgements often enter in, explicitly or implicitly. Formal analytical approaches must be transparent and well justified in order to gain credibility.
- deciding the ways in which emission limit values will be set. There is a tension between the BAT/technology driven approach implicit in parts of the Directive and the more effects-based approach implicit in the UK's BPEO methodology. At the European level, some parties will also want to see uniform emission limits which harmonise competitive conditions set, while others will prefer approaches which more readily reflect local conditions. New plants may operate under a relatively harmonised set of emission values while permits for existing or modified plants reflect the characteristics of individual plants and local environmental conditions. If serious assessments of environmental impacts are to be considered in setting permit conditions, companies will need to allocate time and resources for the task.

- the role of cost factors in determining permit conditions. Formally, the IPPC approach stresses cost-advantage trade-offs while the British approach relies on related cost-benefit considerations. In practice, cost alone appears to have been the determining factor in many authorisations of existing British plants where inadequate information was available for a full assessment. Techniques and criteria for judging cost-advantage trade-offs may need to be developed further.
- extending the current British system to incorporate the preventive principle at the heart of IPPC and taking into account energy and resource use, waste and plant decommissioning. The development of techniques and approaches for doing this remains a challenge.

Finally, under the Fifth Environmental Action Programme (European Commission, 1993), the EU has an ambition to extend the range of policy instruments beyond traditional command-and-control approaches such as IPPC. If waste and energy use are subject to environmental taxes for example, what are the implications for applying IPPC? Should waste and energy be subject to 'double regulation' or would green taxes 'internalise' the environmental costs making any treatment of these issues inside the IPPC system redundant? The problems associated with overlapping systems of different policy instruments are a key consideration for the future.

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The IPPC Directive
Prospects for a Level Playing Field in Europe

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The goal of a level playing field is important, because it recognises the desirability of allowing industry sectors in different Member States to compete on equal terms. This paper examines the prospects for a level playing field in Europe under the IPPC Directive. It first considers the extent to which a level playing field is an objective of the Directive. The paper then analyses elements of the Directive which seem likely to allow the playing field to slope, and aspects which will have a levelling effect. It also briefly considers what other EC policy initiatives might assist the Directive in achieving a greater degree of uniformity.

Is the IPPC Directive Intended to Achieve a Level Playing field?

It can be argued that the Directive does not, as a primary end, pursue the objective of a level playing field. For a start, the legal base of the Directive is Article 130s(1) of the EC Treaty, which places IPPC as an element of 'pure' environmental policy. Had IPPC been viewed as relating more directly to the establishment and functioning of the internal market, due to its potential to harmonise the conditions of competition, it more properly should have been based on Article 100a(1) of the Treaty.

The main objectives and principles of EC environmental policy are set out in Article 130r of the Treaty. There is nothing in this Article which suggests that a level playing field is an explicit objective of EC environmental policy measures. At the same time, the adoption of measures under Article 130s should also be in alignment with the objectives of the EC Treaty as a whole, as set out in the excerpt from Article 2 which follows (as agreed to be amended at the Amsterdam Summit on 18 June 1997):

The Community shall have as its task, by establishing a common market and an economic and monetary union and by implementing the common policies or activities referred to in Articles 3 and 3a, to promote throughout the Community a harmonious, balanced and sustainable development of economic activities, sustainable and non inflationary growth, a high degree of convergence of economic performance, a high level of employment and of social protection, a high level of protection and improvement of the quality of the environment, the raising of the standard of living and quality of life, and economic and social cohesion and solidarity among Member States. (emphasis added)

Article 3 of the Treaty identifies various fields in which Community activities are to support the objectives of Article 2, and includes the provision that there is to be 'a policy in the sphere of the environment'. By combining this

provision with the highlighted sections in the excerpt from Article 2 above, it can be seen that:

The Community shall have as [one of] its task[s], by implementing a policy in the sphere of the environment, to promote throughout the Community a high level of protection and improvement of the quality of the environment.

Thus the pursuit of environmental protection and improvement can be an end in itself for some EC policy, measures. Of course, a balance is required, so that the pursuit of environmental goals should not work against the internal market or the goals of other EC policy areas.

An environmental measure which has a significant effect on competition should be based on Article 100a to reflect this interaction. In contrast, measures under Article 130s are deemed to relate only or predominantly to environmental protection.¹ It should be quite acceptable for such measures to be competition-neutral, or to have only a minor effect.

A further feature of 'pure' EC environmental policy measures under Article 130s, such as IPPC, is that they offer a relatively high degree of freedom for Member States to apply stricter standards. The scope for Member States to go beyond the standards of measures adopted under competition legislation is much more limited.

Where may the Playing Field of IPPC Slope?

As noted above, there appears to be no explicit requirement for IPPC to level the European playing field for the industries it regulates, although this might be an incidental outcome. It is also clear that the Directive sets only minimum requirements, leaving Member States relatively free to impose any more demanding obligations. In addition, there are several areas where the Directive allows or may lead to different requirements in different Member States, as shown in the examples below.

Definition of 'Best Available Techniques'

Article 2(11) presents a rather complex definition of the term 'Best Available Techniques' (BAT). Determination of whether the 'best' 'technique' is 'available' is to consider, among other things, 'the costs and advantages', the boundaries of which may be interpreted widely or narrowly. Some Member States may seek to undertake a full cost-benefit analysis (placing values on *all* costs and *all* benefits of an action or lack of action), while others may simply weigh the marginal costs of abatement against the marginal environmental protection provided. Even if Member States were to adopt a similar interpretation of the *boundaries* of 'costs and advantages', they still would not necessarily apply an equal degree of control. Two countries could evaluate the 'advantages' of the same level of environmental protection and reach quite different answers.

The definition of BAT also refers to a list of issues, in Annex IV of the Directive, to which special consideration should be given. These could lead, quite legitimately, to different conclusions on what is BAT by different Member States. This is illustrated in Box 1 by reference to two of the points in Annex IV: 'the nature, effects and volume of emissions concerned'; and 'the consumption and nature of raw materials (including water) used in the process and their energy efficiency'.

Box 1: Possible Differences in the Determination of BAT

Two installations producing 'euro-stuff' are to be brought under IPPC, one in a northern EC country, the other in the south. The two main options for plants manufacturing 'euro-stuff' are the Watery Process and the Smoky Process. The Watery Process is notable for large water consumption, while the Smoky Process causes high emissions of acid gases. The northern country has plenty of water and is concerned about acid rain damaging its lakes and forests, so it chooses the Watery Process as BAT. Conversely, water is much scarcer in the southern country, and acidification is less of a problem, so the Smoky Process is chosen. The two impose different requirements on the plant operators, and may have different compliance costs. At the same time, they represent the most appropriate BAT solutions for the environments in which they apply.

Emission Limits

Article 9(3) requires emission limits to be specified in permits, while Article 9(4) states that these are to be based on BAT, 'taking into account the technical characteristics of the installation concerned, its geographical location and the local environmental conditions'. As discussed previously, the determination of BAT itself is unlikely to be consistent between Member States, and this will transfer though into variations in emission limits. This is illustrated by experience under Directive 84/360,² which requires Member States to apply emission limits for releases to air from certain industries, following an evaluation of BATNEEC. Taking the example of dioxin emissions from the metal industry, Box 2 shows how different outcomes have followed from this obligation in France, Germany, Luxembourg and the UK.

Variations in standards will also follow from the need to take technical characteristics, geographical location and local environmental conditions into account. It will clearly be sensible, for example, to allow for the fact that some emissions to atmosphere will be in areas where inversion zones are common, while others will be in regions with no dispersion problems.

Box 2: Standards for the Control of Dioxins in the Metal Industry

France: There are no national emission standards or specific operational controls relating to dioxin emissions from manufacturing industry. Individual controls are imposed at the discretion of the competent authorities, following a requirement to apply BATNEEC set by a 1993 Ministerial Order³ under national law⁴. No technical guidance, advice or instructions on dioxin releases from the metals sector has been produced, so the authorities have no reference on which to base any conditions in authorisations. As a result, the usual practice seems to have been to exclude dioxin emission limits in authorisations for steel or other metallurgical plants.

Germany: A federal Act⁵ and associated technical guidelines⁶ require certain industrial plants with potential to harm the environment to be operated such that environmental damage is prevented by the use of 'Stand der Technik' (SdT - 'state-of-the-art'). SdT is more demanding than the standard of 'allgemein anerkannte Regeln der Technik' (aaRdT - 'generally accepted rules of practice' - more equivalent to BATNEEC) applied to less hazardous processes. A dioxin limit of 0.1 ng/m³ - the legal maximum for waste incineration set by the seventeenth federal Ordinance under the Act⁷ - provides a guideline for other sectors. Actual limits in permits are set by the *Länder*, and it appears that some believe they cannot impose binding dioxin emission limits for manufacturing facilities as the law does not support such a quantitative approach. Rather, the requirement is to apply SdT through primary measures (both resource-related and process-related) regardless of the resulting emission levels. There are, however, some exceptions to this position, for example in the *Land* of Bremen, where a legally-binding dioxin limit of 0.1 ng/m³ has been applied to steel industry authorisations.

Luxembourg: Under a 1990 law⁸, the government has issued guidance⁹ for determination of emission limit values based on 'meilleure technologie disponible' ('best available technology'). The general threshold recommended for dioxins is 0.1 ng/m³. Actual limits take account of the guidance but are set on a case-by-case basis. For new plant, if an operator can demonstrate that technology to meet the recommended threshold is not available, the competent authority may allow higher emissions for a period of up to five years. In no case, however, may the higher limit for dioxins exceed 1 ng/m³. When the national steel manufacturer recently replaced some of its traditional blast furnaces with new electric ovens, these were first subject to dioxin emission limits of 1 ng/m³, falling to 0.1 ng/m³ from the start of 1997.

UK: Metal production and processing including iron and steel plants are subject to Integrated Pollution Control and the requirement to apply BATNEEC under national law.¹⁰ Guidance Notes for IPC set out an 'achievable release level' for dioxins of 1 ng/m³ for various activities in the metals sector. Actual emission limits for dioxins are determined on a case-by-case basis. While the Guidance Notes provide a source of reference, the 'achievable release levels' are not legal requirements, and the regulator is not legally obliged to impose any release limits at all.

Compliance with Permit Conditions

Article 14 of the Directive requires Member States to ensure that permits are complied with, operators provide data to competent authorities, and competent authorities are given the necessary assistance to be able to undertake inspections. It says nothing, however, about the degree of effort to be put into enforcement and the penalties to be applied to violations. In practice, the extent to which Member States seek to prevent violations and respond to them will vary. As a result, there will not be a completely level playing field even if exactly the same standards are applied in all Member States. In one country, installations may be subject to frequent inspection, aggressive prosecution and severe penalties. In another, inspection and prosecution may be rare, and penalties minor. In the latter case, not only is there a danger that the environment is not being properly protected, but there is also a clear risk that errant operators will gain an unfair advantage relative to competitors in other countries.

How might the Directive support a Level Playing Field?

The review above has noted a number of provisions of the IPPC Directive which may allow Member States to adopt different standards or procedures for control. However, there are several important aspects of the Directive which should move the EC towards greater uniformity of control. Some of the main points are discussed below.

The Objective of a 'High Level of Environmental Protection'

According to Article 1, the Directive has the objective of 'a high level of protection of the environment as a whole'. This accords with Article 130r(2) of the EC Treaty, which dictates that EC environmental policy is to aim at a high level of environmental protection. It also follows the broader objective specified in Article 2 of the Treaty, namely that a high level of protection and improvement of the quality of the environment is one of the fundamental aims of the Community.

Earlier discussion has noted how the determination of BAT and the specification of emission limits and other controls may vary between Member States. However, the judgement of Member States in this respect may not extend beyond a point at which a 'high level of environmental protection' is excluded. Although each Member State has some discretion to reach its own decisions based on national interests and local factors, these may not override the broader EC interest of a high level of protection for the environment. Any Member State applying suspiciously low standards could be challenged in law on this test. This underlines the need for opportunities to dispute authorities' decisions to be reasonably available in law, both at the national and EC levels.

The Broad Scope of the Directive

The scope of the Directive, in terms of industry sectors to be regulated, is identified in Article 1 which refers to a list of activities in Annex I. Although there is some ambiguity in the wording of this annex, which may lead to some variations in interpretation, the extent of any such variations should be small compared to the overall scope. The Directive therefore ensures that, for the most part, comparable industry sectors will be subject to common procedures and principles across the EC (see below). Any differences in coverage will still be much less than would arise in the absence of the Directive.

Common Procedures and Principles

A fundamental way in which the IPPC Directive supports uniformity is by creating, in broad terms, a common licensing procedure. Specifically, it requires an evaluation of an installation's overall environmental impacts to be undertaken, and licence conditions to be imposed in an integrated manner.

The Directive also establishes a set of 'general principles' for the setting of permit conditions (Article 3), as well as various considerations for the determination of BAT (Annex IV). Under Article 3 competent authorities must 'ensure that installations are operated in such a way that' the principles - which include avoidance of waste, efficient use of energy, and prevention of accidents - are followed. It appears unlikely that all Member States will consider these factors in exactly the same way or reach the same results. The key point, however, is that regulation of all IPPC sectors across the EC will have to consider the matters raised by Article 3 and Annex IV, which are important environmental issues previously excluded from many national authorisation procedures. It is important that they have been brought consistently into the picture of licensing in each Member State, even if the precise details of their consideration are not entirely uniform.

Environmental Quality Standards

Article 10 of the Directive states that where an environmental quality standard requires stricter conditions than are achievable by the use of BAT, additional measures must be required in the permit. As a result, EC environmental quality standards provide a common level of protection which must be respected in all IPPC permits throughout the Community. In a sense, such quality standards can be seen as defining a level at which the EC's and the Directive's overall shared objective of 'a high level of environmental protection' are achieved.

Exchange of Information

Under Article 16 of the Directive, Member States must provide the Commission with information on emission limits applied and the determinations of BAT on which those limits have been based. These data will then allow the

Commission to undertake an 'exchange of information ... on best available techniques; associated monitoring, and developments in them'. According to Annex IV, resulting information published by the Commission is to be taken into account in determining BAT at the national level.

In establishing the information exchange, the Commission has initiated the production of a series of so-called 'BAT Reference Documents' or BREFs. The Commission has set out a plan under which BREFs for all sectors are to be published before 2002, with the first four documents (covering the steel industry, cement and lime, paper and pulp, and vacuum and cooling systems) due to be finished in 1997. The BREFs are expected to include information on what sort of environmental performance is 'achievable' for each sector, particularly in relation to emission levels.

The BREFs are to be taken into account in determining BAT at the national level, but they will not be prescriptive documents setting standards which *must* be followed. The determination of BAT by a competent authority should still take account of the other points listed in Annex IV, while the setting of permit conditions should consider site-specific issues. Nevertheless, the BREFs should support greater uniformity. Some Member States may rely on the BREFs as their main source of reference in permitting, in which case their content is likely to be quite influential. Moreover, publication of data indicating what is achievable should create a pressure for those Member States authorising substantially less demanding performance to move towards stricter requirements. At the very least, Member States whose controls are generally well below the BREF levels are likely to have to produce persuasive reasons for their decisions, to satisfy public concern if for no other reason.

Community Emission Limit Values

The information exchange may reveal any wide discrepancies between the standards applied in different Member States. It may then be appropriate to consider further EC action, either to correct distortions to competition, or to prevent Member States from applying standards which are too lax. The Directive recognises the possibility of such action in Article 18(1), by providing for Community emission limits to be proposed, although it appears unlikely that this will occur for some time.

Any emission limits set under the IPPC Directive would act in support of uniformity, since no Member State could impose less demanding conditions. However, Community emission limits would not in themselves deliver uniformity, because their expected legal base of Article 130s would still allow the 'greener' Member States to apply stricter standards.

In the absence of new EC emission limits under IPPC, Article 18(2) provides that various items of existing EC

legislation are to define minimum requirements to be reflected in permits. These will act in support of uniformity, but only to the extent that they will prevent some standards, for a limited number of sectors, from going below a minimum level. Member States will continue to have the option of applying stricter standards. This is illustrated by controls on municipal waste incineration regulated under Directive 89/369¹¹, which is one of the Directives providing minimum standards for IPPC. Table 1 reproduces the Directive's standards, together with national requirements in German law¹² which are considerably stricter than the EC demands.

Table 1: Municipal Waste Incineration (> 3 tonnes/hour) Emission Limits (mg/m³)

Pollutant	EC Limit	Germany
Total Particulates	30	10
HCl	50	10
HF	2	1
SO ₂	300	50
Cd + Hg	0.2	0.1 (includes T1)
Ni + As	1	0.05 (includes other heavy metals)
Other heavy metals	5	included with Ni + As

What other Measures might support a Level Playing Field?

Aside from the requirements of the Directive itself, other EC initiatives may support IPPC's contribution to a level playing field. Three in particular are discussed below.

The IPPC Implementation Forum

The Commission has established a so-called 'implementation forum' to consider a number of issues arising from the IPPC Directive. This involves wide participation from the Member States, addressing questions of interpretation and approach in applying IPPC.

The creation of the forum is, in some respects, an admission that the Member States adopted the IPPC Directive without clear agreement on its meaning and requirements. This is not surprising, since a large degree of compromise and intentional ambiguity were necessary to secure agreement on the Directive. It remains to be seen if the forum can achieve the consensus of thought that three years of negotiation was unable to produce. Nevertheless, the forum is likely to support rather than counteract uniformity. It is perhaps more likely to be successful if it concentrates on issues of methodology, such as how to achieve an integrated approach, rather than reopening debate over points left intentionally vague in the Directive.

Other Legislative Developments

Various items of proposed EC environmental legislation may complement IPPC's contribution to a level playing field. In particular, proposals for new air quality standards which have recently been published¹³ would provide a common factor to be respected in IPPC permitting. The proposed water framework Directive¹⁴ is also relevant,

providing for river basin management plans which would affect the context of 'local factors' for IPPC.

Implementation and Enforcement

The limited detail of the IPPC Directive on the topic of implementation and enforcement is common to many Directives. This leads to difficulties when Member States fail to implement Directives properly, or when enforcement action is lacking. Recognising these problems, the Commission has published a Communication on *Implementing Community Environmental Law*¹⁵, which made several important proposals:

- *Establishment of minimum criteria for inspections.* If followed, these would help to reduce the extent of variations in this area across the EC. However, to avoid offending sovereignty the Communication suggested that the criteria would be established only as guidelines rather than mandatory requirements.
- *Specification of sanctions for non-compliance.* The Commission suggested that future EC legislation may specify the sanctions to be imposed on violators. This could help to promote uniformity of enforcement penalties and so contribute to a level playing field. It is too late for IPPC, however, and in any case, the Council's response¹⁶ to the Communication clearly states that sanctions 'remain in Member States' competence'.
- *Environmental mediators and access to justice.* The Commission proposed two mechanisms to promote better implementation and enforcement at the national level. The first is the idea of environmental 'mediators' - designated persons to whom complaints about implementation could be presented, avoiding the need to resort to the Commission. The second is the goal of better access to justice for individuals and interest groups. There is considerable merit in both of these ideas, although their fate is uncertain. The Council's response was cautious, inviting the Commission to report on existing administrative and judicial mechanisms for dealing with complaints, and to consider the need for minimum criteria or guidelines on the basis of this report.

Conclusions

The provision of a level playing field is not a primary aim of the IPPC Directive. Rather, its main goal is a high level of environmental protection, to be achieved through an integrated approach to the licensing of industrial installations.

Compared with the situation that would arise in the absence of the Directive, IPPC will support a level playing field in many respects. This is because the Directive establishes the framework for an integrated licensing regime across the EC, based on a common procedure and

principles, and broadly equivalent coverage. All authorisations must meet the standard of a high level of environmental protection, which is given some focus by EC environmental quality standards. The production of BREFs should also support uniformity.

Some aspects of the Directive inevitably offer scope for different requirements to be applied. One reason for this is ambiguity in the Directive, creating the possibility of inconsistent interpretation. In an ideal world, Directives would be free of ambiguity. The reality, however, is that a certain amount of imprecise text reflecting sensitive compromises was necessary before agreement on the IPPC Directive could be reached.

Even if imprecision were absent, the Directive would still provide legitimate grounds for variations between Member States. Fundamentally, the objective of a high level of protection and the holistic, multi-media approach turn to a high degree on the ability to take account of local environmental and site-specific factors. Added to this, it must be recognised that Member States have different administrative systems and cultures. IPPC must be fitted into these. It would be unrealistic to expect traditional approaches to be swept aside so that identical regimes can be introduced in every Member State.

Any suggestion that variability under IPPC is a failing to be corrected is countered by the reality that uniform controls for each sector would not provide maximum environmental protection, nor would they alone deliver a level playing field. If identical standards and procedures were adopted, the achievement of a consistently high level of environmental protection would require EC-wide consensus on the value of environmental assets, as well as elimination of local environmental variability, neither of which is realistic.

Overall, there should be an acceptance that some variability will arise between (and indeed within) Member States in applying IPPC. This variability should not go beyond reasonable limits, however. If it does, two responses are possible.

The first possible response is harmonising legislation. If varying domestic standards under IPPC were to cause the playing field to tilt excessively, it might be appropriate to consider EC emission limit values defining minimum standards. An alternative route would focus on environmental objectives to be pursued, supporting more uniform interpretation of minimum requirements to deliver a 'high level of environmental protection'. Such objectives could be defined through environmental quality standards, or through top-down targets such as those being considered in the Community's strategy against acidification.¹⁷

The second possible response to excessive variations - particularly when due to unreasonably low standards in some Member States - is enforcement. This should be

undertaken at the EC level where appropriate, but ideally it should also be a realistic option in national courts. Domestic implementation should aim to establish a system which effectively meets IPPC's requirements, and any competent authority which applies this system to its own satisfaction should be confident in the answers it reaches. It should then be able to justify those answers if challenged, in a court of law or elsewhere. In order to support thorough and uniform application of EC law, therefore, Member States should accept the need for new enforcement mechanisms, such as those recently suggested by the Commission. Rejecting such mechanisms detracts from the goal of environmental protection and undermines the provision of a level playing field.

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2. Directive 84/360/EEC on combatting of air pollution from industrial plants, OJ L188, 16.7.84.
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New Dimensions of Policies Towards Sustainable Industrial Development
The Dutch Approach

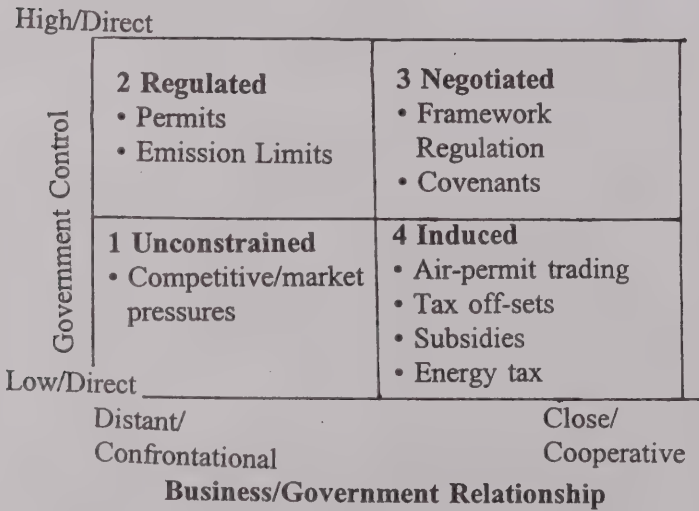
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Policy makers all over Europe are faced with the challenge of enlarging prosperity and at the same time improving environmental quality. This paper describes some Dutch experiences on overcoming this dilemma, resulting in a dramatic improvement in the environmental performance of industries in The Netherlands, while at the same time strengthening its competitiveness. The key for achieving this is in sharing responsibility between government and industry.

Phases in the Development of Policies towards Sustainable Industrial Production

In environmental policy making, different phases may be identified. Figure 1 represents a model for this; it shows how government can exercise direct or indirect control on industrial environmental performance (vertical axis) and how government and industry can choose between a distant and confrontational, or a close and collaborative relationship (horizontal axis).

Figure 1: Phases in Development of Government Policies



If one analyses the development of environmental policies, one can recognise these different phases or, approaches. At first there is a situation in which business is largely unconstrained by environmental requirements of any kind. Due to public awareness and political pressure, strict environmental controls are put on industries, mainly by unilateral government action.

In this command and control phase, legal instruments - such as permits and discharge limits - are developed, often in relation to air pollution, waste or water pollution. In many cases, legal requirements become increasingly detailed.

However, in the long term, command and control approaches are not effective. They do not encourage industry to direct its innovative potential towards finding major environmental improvements in production processes and products; rather, they encourage "end of pipe" solutions which result in only "small step" improvements, along with on-going increases in costs. After picking the "low hanging fruit", environmental policies become more integrated in nature and will have more impact on companies. Environmental policies focus more and more on energy and resource efficiency. Issues that, given their complexity in a technological and economic sense, are hard to regulate by government. This calls for another approach which needs more flexibility and which appeals to industry to take on responsibility to deliver more environmental improvement. These types of approaches can be found in phases 3 and 4.

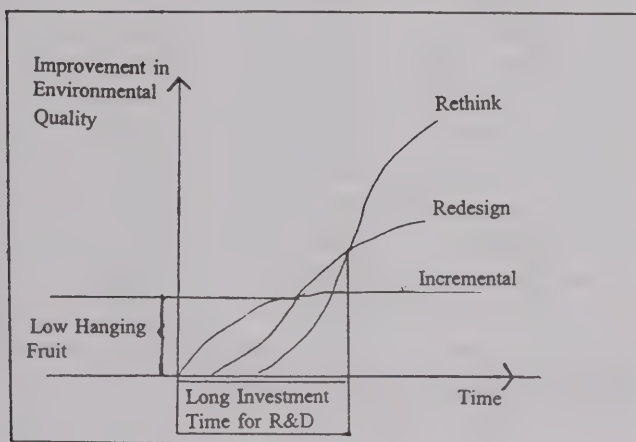
In the negotiated phase, the government sets targets and objectives, but it also makes provision for negotiations between the authorities and industry. The negotiations allow industry to influence the targets and objectives, and to set a suitable timescale. Industry is left largely free to determine the means by which the targets and objectives will be met. Working with the same agreed environmental agenda, this approach can be characterised as close cooperation between government and industry. The covenant approach followed in The Netherlands is an example of this. Also typical of this phase is the development of integrated permitting systems, such as that in the European Union's IPPC Directive.

The induced approach (phase 4) includes policy instruments such as air permit trading, tax-off-sets, governmental subsidies and energy taxes. These instruments will encourage, rather than force, industry to improve. It rewards companies which invest, making improvements possible which go beyond minimum standards.

An ideal situation is to achieve again the unconstrained phase, in which government control is replaced by competitive market-forces. This happens when competitive forces in the market impose all the required incentives for sustainable industrial development.

When industry has committed itself to make progress towards sustainable industrial development, there are three distinct pathways to a higher performance: incremental, redesign and rethink (Figure 2).

Figure 2: Phases in Development of Business Policies



The **incremental** option is close to today's methods of environmental improvement. It is based on "end-of-pipe" solutions and often related to command and control approaches. This option delivers significant progress in the early stage of development by picking the low hanging fruit. However, in the long run, for further improvement, "end-of-pipe" solutions will become less effective and more expensive.

The **redesign** option requires the reformulation of products and processes to deliver a major reduction in environmental impact. Redesign options are also known as "prevention of pollution" or "process integrated" solutions and focus not only on classical environmental themes but also on energy and resource efficiency in the life-cycle of a product. Implementing this type of measure is often combined with new investment. It requires investment in research and development and it takes time to achieve. An example is the widespread redesign of CFC-using processes in response to the issue of ozone depletion.

The **rethink** options are the most radical in nature. They require a major shift in patterns of production and consumption, and deliver quantum leaps in performance improvements. The environmental benefits of rethink options are often unpredictable at an early stage and often difficult to measure and to manage. An example of a rethink approach is the application of information technology to reshape work and shopping patterns and to deliver dramatic reductions in environmental impacts in the traffic and transport sector. Another example will be in future solutions to reducing emissions of carbon dioxide. This problem will in time require completely new power generation technologies and distribution networks.

Cooperation Between Industry and Government based on Environmental Management Systems

Some Experiences in The Netherlands

In the following example, a major step has been made from a command and control approach towards an approach based on cooperation between government and industry. After the command and control approach of the 1970s and 1980s, an important step towards sustainable development was made in 1989 when the National Environmental Policy Plan (NEPP) was published. Based on this Plan, emission reduction targets to be met by industry are in the order of 50% - 70% for the year 2000 and 80% - 90% for the year 2010.

Across the board, energy efficiency has to be increased by 20% by the year 2000 in relation to 1990 levels. As a result of these ambitious objectives, it was clear that environmental policies had to be more integrated into economic decision making. It was also clear that government can never, on its own, bring about the necessary change to sustainable development. Both government and industry have recognised the need for a complementary approach which will allow more flexibility and efficiency and which will appeal to the responsibility of industry to deliver real environmental improvements as an alternative to the traditional command and control approach.

In practice this approach is based on four inter-related activities:

1. implementing environmental management systems in accordance with ISO 14001 and the EU's EMAS Regulation;
2. every four years, drawing up company environmental plans (CEPs) on a company by company basis;
3. issuing a licence on outlines for production sites, which is based on the CEP and which will allow industry flexibility in the means to meet the objectives and targets mentioned in the CEP; also, enforcement will aim to ensure the environmental management system is properly implemented;

4. companies give account of their activities to the government and the public in an annual site report on environmental performance; transparency in the way in which environmental management is carried out in companies is important in this respect, and reliability of company information is a precondition.

Work on these four activities is carried out simultaneously with close cooperation between government and industry.

Target Group Approach with Regard to Industry

One of the most striking features of environmental policy in The Netherlands is the so-called target approach for industry. This approach implies the translation of longer term environmental quality objectives into quantified emission reduction, energy and waste reduction targets for different sectors of industry - for instance the chemical industry.

A fundamental principle underlying this approach is that responsibility for achieving the targets lies primarily with the industry sector concerned. The Government therefore encourages companies to enter into environmental agreements - in The Netherlands called covenants. These covenants provide the framework for the process of implementing the targets established for selected industry sectors and cover the following issues:

- 1. targets for the specific sector for the years 2000 and 2010;
- 2. individual companies within the sector must draw up company environmental plans (CEPs) every four years, specifying the environmental measures to be taken over the next four years; the company can set its own priorities. The CEP is discussed with the licensing authorities and if they agree it, it will be used as the basis for issuing a licence to the company;
- 3. the monitoring of all CEPs against the sector targets; bottle necks are evaluated in a Consultative Group at sector level with participation from all the involved parties. The results of the evaluation will guide the next cycle of CEPs. In this way, the further development of environmental policy within the industrial sector concerned is focused on the right priorities.

Within the target group approach, a planning cycle can be established for different industrial sectors. Every four years the circle is completed and by this repetition we are able to achieve the sector targets in time. The first results of the target sector approach are very encouraging. In 1994, some 120 companies in the chemical industry completed the first round of CEPs. The aggregated results of these plans are shown below and are compared with targets for the sector as a whole (IETP).

With reference to the different themes, such as climate change, acidification etc, many of the sector targets are within reach or have already been met. With regard to pollution by toxic substances, the targets for 2000 will be met by two-thirds of these so called priority substances. A Consultative Group at sector level has completed a detailed analysis of the components for which targets in the year 2000 will not be met and will come up with proposals for meeting the targets.

Results CEPs Chemical Industry (1)

	2000 Target	2000 CEPs
Acidification		
- sulphur oxide	75%	80%
- nitrogen oxide	60%	61%
Priority substances to air		
- ethene	50%	65%
- acrylonitrile	50%	90%
- ethylene oxide	50%	76%
- benzene	75%	89%
- styrene	50%	83%
- trichloromethane	50%	90%
- 1,2-dichloroethene	90%	91%
- vinylchloride	90%	77%
- tetrachloroethene	90%	71%
- mercury	70%	48%

Results CEPs Chemical Industry (2)

	2000 Target	2000 CEPs
Priority substances to water		
- toluene	50%	90%
- benzene	75%	83%
- styrene	50%	92%
- phenolates	50%	96%
- 1,2-dichloroethene	55%	87%
- mercury	50%	76%
- cadmium	90%	98%
- arsenic	50%	83%
-chlorophenols	99%	96%
Eutrophication		
- nitrogen	70%	68%
- phosphates	75%	88%

Environmental Management Systems

Implementing a CEP within a company requires a valid and operational environmental management system. ISO 14001 provides the company with a management tool for achieving its goals. Such a management system generates

an internal planning cycle within the company that may be linked to the sectoral planning cycle. These two cycles come together in the company environmental plan. In the wording of ISO 14001, the CEP corresponds to the chapter on objectives and targets and environmental programme. Figure 3 clarifies this relationship.

This approach opens a new perspective for licensing industrial companies under the IPPC directive. Within the command and control approach, the traditional licence issued to an industrial site is usually very extensive. It normally targets the subsequent different primary processes within the site in detail. For this reason such a licence usually contains some hundreds of requirements. The licensing authority prescribes in detail the means to be used by the company to control its environmental impact.

Rather than a licence that lays down detailed measures for the various parts of the site, the outline licence contains the objectives for the site as a whole. The objectives are derived from the company environmental plan, which is discussed and approved by the licensing authorities. The environmental management system translates these objectives into measures for the different primary processes within the site. The company is free to choose the most cost-effective measures. Such a licence will also contain conditions on the annual reporting of environmental performance and on notifications for abnormal events. An outline licence will be no more than several pages with a few dozen requirements at the most; thus, enforcement is focused on the main issues and is based on the assumption

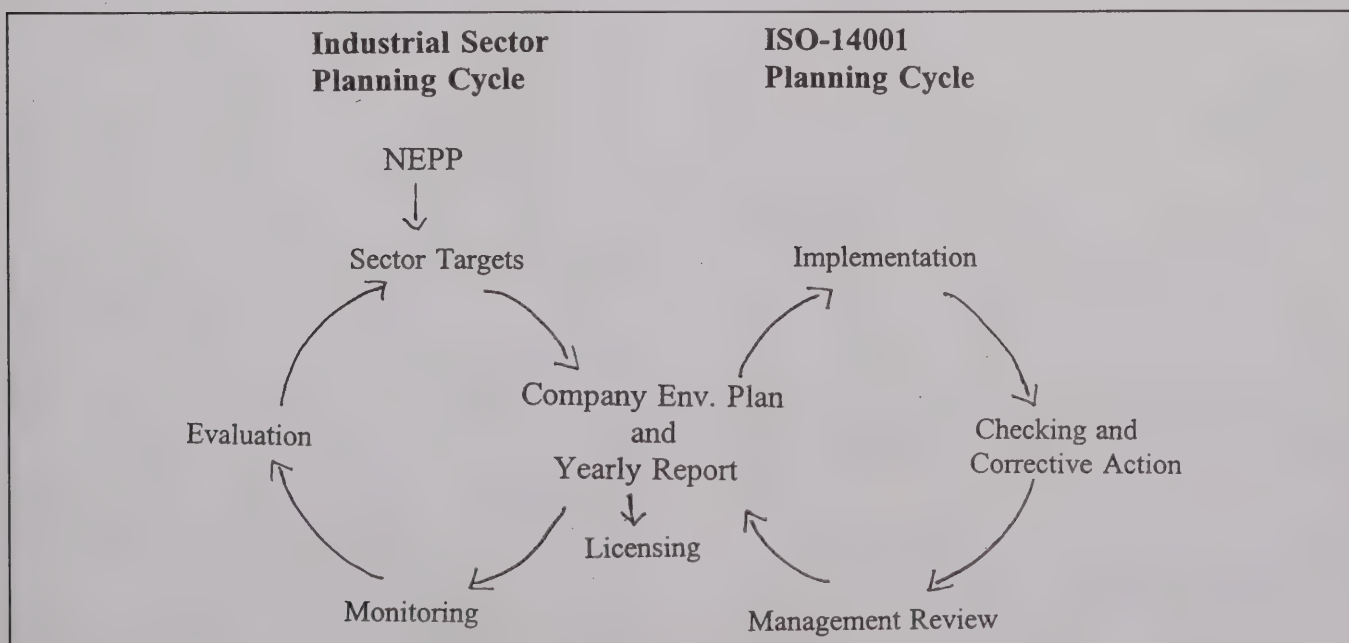
that the company's management system has led to more self-control. Such a system of licensing and enforcement offers the company much more flexibility. Experimenting with this new licensing process shows that significant savings of environmental costs in the order of 20% - 50% are possible without compromising the necessary environmental results.

Conclusion

Effective and efficient environmental policies challenge industry to direct the innovation process in companies into improving energy and resource efficiency. Environmental management systems within companies create a framework and safeguard for turning a company's commitment to sustainable industrial development into actual environmental improvement. Policy frameworks should in this perspective focus on long term targets for industry instead of detailed regulation. The Dutch covenant strategy is an example of relating such a strategy to the IPPC directive.

The legislative and cultural context in The Netherlands does of course differ from that in the UK. However, the individual responsibility of companies to tackle environmental problems is universal and the IPPC directive is European. In this respect the Dutch experience may be helpful in further discussions on sustainable industrial development.

Figure 3



Phases in the Development of Policies towards Sustainable Industrial Production

UK Implementation of EU Directive 96/61 on Integrated Pollution Prevention and Control

Comments by the National Society for Clean Air
and Environmental Protection

A. General Comments

The National Society for Clean Air and Environmental Protection welcomes the publication of this first consultation paper from the Department of the Environment, Transport and the Regions (DETR) on the implementation of EC Directive 96/61 in the UK. The paper also sets out a number of possible changes to the UK's current IPC system which are not required by the Directive but which clearly deserve detailed consideration at this time.

The Society supports the more holistic approach to pollution control inherent within the IPPC Directive, and believes that it should provide an important catalyst to the development of more sustainable industrial processes. The Society also notes with approval that the Directive will for the first time require consideration of energy use, noise and waste recovery issues within the UK regulatory system.

However, the NSCA believes that further consideration should be given to the extent to which a positive linkage might be created between the IPPC system and the use of internal company environmental management and audit systems (such as EMAS and ISO-14001). Such a linkage could further assist the process of internalising environmental concerns (beyond simply a culture of regulatory compliance) and promoting the innovation of clean technologies, whilst also reducing regulatory costs. This is one area where the UK might usefully draw critically upon the Dutch experience of implementing policies for sustainable industrial development (see this issue of *Clean Air*), and which might usefully form the basis of a more detailed separate consultation.

NSCA particularly welcomes the open approach taken by the DETR with respect to the possibility of using Coordinated Pollution Control (CPC) rather than IPC as a mechanism for implementing the Directive for certain installations. The CPC approach has considerable merit and there would be a strong case for designating local authorities as the lead regulators under any such system. However, NSCA believes that the organisational changes necessary to implement IPPC should be considered in their broader political context. Further consideration will therefore be required of how these changes might complement or link into the Government's proposals for devolution and the development of regional government.

The Government's willingness to reconsider the issue of "sectoral affordability" is also particularly welcome. As the

consultation paper correctly points out, there is a strong case for dropping the sectoral affordability criterion in order to reduce environmental costs and avoid market distortions across industrial sectors. Such a move would help to reconcile the objectives of environmental regulation and industrial competition policy - promoting higher environmental standards within the context of a level playing field for UK industry. NSCA therefore supports the phasing out of this criterion (see detailed comments below).

Another key question is whether the Directive will be transposed into UK law via primary or secondary legislation. The Society considers that implementation should be via primary legislation. This would allow greater flexibility in the treatment of issues such as sectoral affordability. It would also avoid the development of a messy two-tier (IPC/IPPC) regime, with certain plants - mainly research and tar distillation processes - not covered by the Directive remaining under the current IPC system.

A further uncertainty is whether the Government will allow existing installations not currently regulated under IPC but subject to the Directive to remain outside whatever new system is adopted until 2007, the EC deadline. The Society considers that all such processes should be brought under control in a phased programme from 1999. This would allow a smoother transition and the more effective use of limited resources on the part of the regulators.

The resource implications of applying a more complex regulatory system to a greatly increased number of installations, than are currently regulated under IPC, will clearly be considerable. This will not only require the introduction of more efficient ways of working on the part of the regulatory agencies concerned, but will inevitably also require significant additional resources. If public confidence in the regulation of industrial pollution is to be maintained, it is essential that the Government learns appropriate lessons from the introduction of the IPC regime. The current system lacks consistency. There is little evidence that principles of *best available techniques not entailing excessive cost* (BATNEEC) and *best practicable environmental option* (BPEO) which lie at the heart of the current regulatory framework have yet been applied fully and effectively. The system must become more transparent, accountable and responsive to local concerns. Consistency must be improved and the transition to the new IPPC system must be effectively managed and properly resourced.

The consultation paper suggests that installations with trivial emissions "*will not be expected to undertake expensive improvements*". Under the current IPC system, processes are exempt from control where they release only what are defined as "trivial" quantities of prescribed substances. However, no such exemption exists under the IPPC Directive. Indeed, the Directive requires the prevention or minimisation of releases of a much wider range of pollutants than controlled under UK IPC. What is more, few such installations will be 'trivial' users of energy or producers of waste. Further consideration of this point is therefore necessary as the DETR's current interpretation is questionable.

B. Detailed Comments

The Society's comments on some of the specific issues/questions raised by the DETR in the consultation paper are set out in detail below. Section and paragraph headings refer to those given in the DETR consultation paper.

1. *The need for, and the merits of, the Government's approach to the thresholds (para 12)*

NSCA considers that a more precautionary approach may be appropriate than that suggested by the DETR in deciding which installations pass the threshold for regulation, as it is not clear that the interpretation adopted by the DETR is in keeping with the spirit of the Directive.

3. *The Government's proposal for measures to be taken when an installation closes down permanently to avoid pollution risk and return the site to a satisfactory state (para 15)*

The Directive imposes a duty upon regulatory authorities to ensure that "the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of operation to a satisfactory state". The consultation paper proposes that this requirement should be "*discharged through a requirement in all IPPC permits for the operator to make a report to the competent authority as to the state of his site before he closes his operation*". The authority would then consider this report within the context of its wider regulatory powers for the remediation of contaminated land, with any enforcement action being taken under those powers.

However, this proposal would appear to fall somewhat short of the requirements of the Directive. In particular, the standard of remediation implied by the "suitable for use" philosophy of the *Environment Act 1995* - which generally relates to the next proposed use of the site - would appear to fall short of the Directive's requirement to avoid "any" pollution risk following the cessation of operation. Furthermore, the Department's approach is arguably inconsistent with the Directive's general emphasis upon a "high level of environmental protection" and its implied requirement for restoration to take place immediately following closure of the controlled installation.

Overall a more forward looking approach is required, with due attention to the avoidance of land contamination from the outset. This issue should be addressed as part of the initial authorisation and routine reviews.

4. *Energy Efficiency Issues (para 15)*

As noted above, the Society considers that the Directive's requirement for competent authorities to take energy efficiency into account is particularly welcome. Indeed, this requirement of the Directive should provide an important mechanism for helping to achieve the Government's target of a 20% cut in CO₂ emissions by 2010.

However, this will not happen if a minimalist interpretation of this requirement is adopted. The statement in the consultation document that "*as a minimum, it is likely that operators will be required to take up all energy efficiency measures which are cost effective on normal commercial criteria*." is therefore somewhat worrying. Without further clarification the phrase "on normal commercial criteria" would appear to be a recipe for business as usual. There is considerable evidence to suggest that in the case of energy efficiency "normal commercial criteria" often fail to deliver cost effective solutions for society as a whole.

The consultation document suggests that "*Alternatively, it could be argued that the balance of costs and benefits might suggest that operators should be required to go further than implementing cost effective measures*." This raises the obvious question of cost effective to whom? The operator or society as a whole? Given its potential importance, this aspect of the Directive clearly requires considerable further consideration (and consultation) by the DETR.

However, the Society welcomes the statement that "*...the requirement to take energy efficiency into account means that regulators will not automatically penalise measures which involve combustion on site rather than remotely ... where such processes lead to higher emissions from the installation itself*" provided that this does not conflict with the requirements of local air quality management.

5. *The extent to which IPPC and Environmental Impact Assessment consent systems might be brought together (para 15)*

The NSCA welcomes the suggestion that, where appropriate, operation of the IPPC and Environmental Impact Assessment consent procedures should be brought together.

7. *Whether changes to consultation procedures are required and in particular, whether all substantial changes should remain subject to public consultation? (para 19)*

NSCA considers that transparency is of the upmost importance if public confidence in the regulatory system is

to be maintained. What is more, whether the impact of a "substantial change" will be positive or negative on the environment may quite rightly be open to dispute. The Society therefore considers that the fuller requirements for public consultation currently applied under IPC should be maintained. In particular, all substantial changes (requiring variations to conditions) whether positive or negative for the environment should remain subject to public consultation.

However, the Society recognises that the consultation procedure does impose costs upon the operator concerned. Further consideration might therefore reasonably be given to ameliorating these costs in the cases where approval is given for firms to make substantial changes which the regulator considers to be beneficial for the environment. In the Society's view, such a development could be entirely consistent with the polluter pays principle.

8. Whether, once the first round of four-yearly IPC reviews is complete, the period between reviews should be extended (para 21)

NSCA considers that once the first round of four-yearly IPC reviews is completed, there may be scope for the introduction of greater flexibility into the review process for those operators who can show that they presented a low risk - that they had a good record of compliance, appropriate environmental management and audit systems (e.g. BS 7750, ISO 1401 or EMAS), etc. The regulatory authorities concerned would need to publish detailed risk management criteria, against which to assess the appropriate frequency of review, along the lines of the Environment Agency's Operator and Pollution Risk Appraisal (OPRA) system. Such an approach could potentially allow the resources released to be targeted at improving the level of inspection and enforcement action against those operators with poor compliance records or who otherwise presented a high risk.

9a) The principle of using CPC rather than IPC as a mechanism for implementing the Directive for certain installations (para 38)

The NSCA welcomes the open approach taken by the DETR with respect to the possibility of using CPC rather than IPC as a mechanism for implementing the Directive for certain installations. The CPC approach has considerable merit. It need not be unnecessarily complicated or bureaucratic.

The Society considers regulatory authorities should be subject to an appropriate level of local accountability and democratic control - subject to the general principle of subsidiarity: in this context this means that responsibility should fall to those best placed - in terms of economy, efficiency, effectiveness and accountability - to undertake them.

Furthermore, given their good record on air pollution control and noise issues, the NSCA considers that there is in principle a strong case for local authorities (in England and Wales) retaining their involvement in the regulation of certain processes (and for the current division of responsibilities for industrial pollution control in Scotland to be reviewed). The CPC approach appears to offer one route through which this objective might be achieved.

In the interests of democratic accountability it may be argued the local authority should be the lead regulator for CPC, as it is the local authority which interfaces most directly with the local community. Indeed, local authorities also have responsibility for a number of related functions which would complement their role as lead regulator under CPC. For example:

- Land use planning: the local authority will have been responsible for considering planning consent for the installation. The information required for IPPC authorisation will complement, and to some extent duplicate, that required for the planning consent.
- Contaminated land: as noted above, the IPPC Directive requires that the sites of authorised processes must where necessary be subject to remediation upon closure of the installation. Local authorities are already responsible for the environmental health and planning development control of aspects of contaminated land. They will also acquire a number of further duties, under Part II(A) of the *Environmental Protection Act 1990*, in due course.
- Noise: local authorities already have responsibility for, and experience of dealing with, noise pollution issues. These responsibilities are likely to be extended further under proposals for ambient noise mapping and control currently being considered by the European Commission, following its recent Green Paper on "Future Noise Policy".
- Local air quality management: lead regulator status would complement local authorities responsibilities for local air quality management which are being introduced under Part IV of the *Environment Act 1995*.

The organisational changes necessary to implement IPPC should, however, also be placed in their broader political context. In particular, such changes should if possible be developed in parallel with the Government's proposals for devolution and the development of regional government.

A more radical approach than either of those suggested in the DETR consultation paper would be to revisit the case for the establishment of a national Environmental Protection Commission and a number of (regionally based) Environmental Protection Executives. This could be done on a model similar to that of the Health and Safety Commission and Executive.

9b) Which installations might be more susceptible to a CPC approach (para 38)

Those processes currently subject to LAPC, which will fall within the remit of the IPPC Directive should also be considered for regulation under CPC (or similar system).

10. The following three options for handling the issue of sectoral affordability: (i) retain sectoral affordability, as at present; or (ii) immediately abandon the sectoral affordability criterion; or (iii) phase out the use of the criterion over a number of years as the regulators' knowledge and expertise becomes sufficient to the task (para 44)

NSCA agrees that there is a strong environmental and economic case for ending the use of the sectoral affordability criterion. Such a step would not undermine the protection for industry intended to be afforded by the BATNEEC principle, nor the sensitivity to local circumstances which that allows. The phasing out of this criterion over a number of years, as the regulators' knowledge and expertise becomes sufficient to the task, would help to reduce any transitional costs and so avoid undue distortions at the level of individual industrial sectors.

Furthermore, the Society recognises that there would be advantages, from both an environmental and economic perspective, in working towards a more consistent approach to this issue (a level playing field) across the European Union as a whole. Indeed, such progress may be important for ensuring industrial support for the phasing out of sectoral affordability in the UK.

It should also be borne in mind, however, that by itself cost/benefit analysis is likely to remain a rather blunt instrument, as it does not deal adequately with issues of equity or intrinsic value. Further research will therefore be required, to develop appropriate methodologies, to ensure that regulatory decisions are as consistent, transparent and accountable as possible.

11. The proposed changes to the guidance on best available techniques (para 46)

NSCA welcomes the DETR's proposed changes to improve the clarity and use of guidance on best available techniques. The fuller discussion of costs and benefits, "indicative" performance standards and upgrading deadlines for existing plant proposed in the consultation paper should all help to improve consistency and reduce uncertainty for industry, whilst at the same time improving the transparency and public accountability of regulation. These measures should also allow regulatory agencies to make better use of their limited resources.

12. The merits of requiring operators to justify any departures from guidance note standards or upgrading timetables in their applications (para 47)

NSCA would welcome a requirement upon both the operator and the regulator to publicly justify any failure to meet guidance note indicative standards or upgrading timetables. Such a requirement would again improve consistency and reduce uncertainty for industry, whilst adding to the transparency and public accountability of regulation. Such a requirement could therefore only assist in promoting public confidence in the IPC/IPPC regime.

13. Whether permitting based mainly on general rules contained in freestanding regulations would be an appropriate means of regulating certain installations (para 48)

NSCA agrees, in principle, that permitting based mainly on general rules contained in freestanding regulations could be an appropriate means of regulating certain installations, such as intensive farms and possibly some processes currently regulated under LAPC.

Where classes of processes are sufficiently homogenous, such an approach clearly holds the potential to improve consistency and allow the more effective use of regulatory resources. However, it would be important to ensure that the use of such general rules did not serve to inhibit the innovative development of cleaner processes and techniques. It would therefore be desirable to retain some degree of site specificity within any such approach (see also below).

15. Whether any system of general binding rules ought to include an opt out (para 48)

In the Society's view an opt-out option for both the regulator and regulatee would clearly be necessary to maintain the site-specific nature of BPEO judgements under any system of general binding rules. Furthermore, in the interests of consistency, transparency and public accountability, any such opt-out should be subject to a requirement upon both the operator and regulator to make public the justification for any departure from those general rules.

AIR QUALITY

Discourse on Air Quality Modelling

D.R. Middleton
Atmospheric Processes Research
Meteorological Office
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Being an imaginary conversation between an air pollution scientist and an environmental health officer, and wherein notable questions raised during the First Phase trials of Local Air Quality Management receive some simple consideration.

Q: *What is mathematical modelling?*

A: To quote from McLone (1976), it is 'the representation of the real or physical world in mathematical terms to obtain a precise understanding of its properties. This may hopefully allow some form of prediction of future events'.

Q: *What is dispersion modelling?*

A: Dispersion models are mathematical procedures to describe how pollutants are spread and mixed in the atmosphere. They are often computer based, but simpler nomogram methods can also be based on physical principles, including the methods in DMRB (Design Manual for Roads and Bridges), NRPB-R91 report (from National Radiological Protection Board), Turner's Workbook (Turner, 1994), or the AEOLIUS Nomograms (submitted to *Atmospheric Environment* by Buckland and Middleton. See also references in the documentation on AEOLIUS from Met Office Internet site below). These nomograms are usually intended to be quick and easy to use, giving a first estimate of the scale of the problem. Nomograms and computer models usually calculate concentration at mass per unit volume from emission rate divided by the ventilation rate (i.e. dilution rate). This multiplies the emissions by a dilution factor.

Q: *Why is dispersion modelling useful?*

A: In the context of air quality management, it provides a way to calculate the contributions to air quality at a place from the different types of emission source. Then air pollution due to each sector can be reviewed and assessed on a fair basis. The assessment can be made transparent and amenable to audit through careful documentation of the data and model that were used. Publicly accountable management plans for air quality are then possible. Modelling can indicate whether the Objectives in the Strategy are achievable by 2005 AD, and reveal the likely geographical extent of an air pollution 'hot spot'.

Q: *How is modelling justified in terms of planning?*

A: The justification for modelling relies on the fact that it gives us:

- a means to identify the individual source contributions,
- enables cost effective and equitable management of emission sectors,
- allows alternative policies to be compared and assessed on an objective basis, and
- it can be used to produce visual and numeric displays for use in public plans, enquiries and exhibitions.

Q: *Once a model is installed, can we use it straightaway?*

A: Any dispersion model has two main inputs, emissions inventory, and meteorological data, and these need to be prepared before the model can be run. Some models will require considerable effort to be expended in preparing the input data. If a GIS system is to be used, suitable maps and related data may also be required. It will be necessary to have all data in the formats and structures as needed by the model. It is a good idea to start by getting together a list of emission sources, ready to assemble the emissions inventory. This will be a very useful planning and assessment tool, even if not much modelling is needed.

Q: *For what sort of things can dispersion models be used?*

A: Dispersion models are used to assess concentrations of material in the air, for use in giving advice and for forecasting in emergency or pollution episode situations.

Q: *What does Met Office research into dispersion models aim to do?*

A: To improve the understanding and description of pollutant dispersion in the atmosphere over a wide range of scales. To help achieve this goal, the research aims are to:

- develop methods to forecast dispersion (or spreading) and deposition (to the ground or sea by adsorption or in rain and cloud droplets) of materials in the atmosphere;

- improve air quality forecasts for the next few days, by giving a longer period of warning, and by achieving a better success rate;
- help analyse pollution incidents, such as when a large peak in concentration of sulphur dioxide or some other substance has been measured, often by using models to see which emission source(s) might be involved;
- support central and local government in local air quality management (*Environment Act 1995*), e.g. in writing a Manual on Modelling, and developing AEOLUS;
- provide a better understanding of urban meteorology, the science which underpins the use of dispersion models in built-up areas.

Q: *Where does the funding come from?*

A: The research division of the Met Office receives funding for its work in dispersion from the Public Met Service, Department of the Environment, Transport and the Regions, Ministry of Agriculture, Fisheries and Food, Environment Agency and other bodies. Their support is gratefully acknowledged.

Q: *What does the Environment Act 1995 say on reviews of air quality?*

A: Section 82(1) of the *Environment Act 1995* gives local authorities a duty to review air quality and inform the public; it says

"Every local authority shall from time to time cause a review to be conducted of the quality for the time being, and the likely future quality within the relevant period, of air within the authority's area."

In effect, the current situation has to be looked at, along with projections forward to 2005 AD, to see if air quality Objectives will or will not be met by then.

Q: *Where can I find the Standards and Objectives?*

A: They are listed in the UK National Air Quality Strategy (available from The Stationery Office).

Q: *What does the Environment Act 1995 say on public information or forecasts?*

A: The Act refers specifically to communication, viz section 87(2):

"...regulations ... may make provision -
(k) for or in connection with the communication to the public of information relating to quality for the time being, or likely future quality, of the air;"

Central Government provides national forecasts of air quality as well as monitoring results. A number of local authorities provide summaries of their monitoring data to local residents, using channels such as local media, public libraries etc. Some also produce their own local air quality forecasts, as these are of public interest. Students can use these in their projects on the environment.

Q: *Why forecast air quality?*

A: It is important to give as much warning as possible when air pollution measurements are found to be high, as this indicates possible health risks to sensitive individuals. It is desirable to predict when this may occur, and to give some indication of the severity of the expected air pollution, so that the public can take appropriate action. This might include changes in planned activities, including transport options.

Q: *Why use dispersion models for the forecasts of air quality?*

A: Dispersion models attempt to describe the various physical processes which affect the quality of the air. They can describe how the hourly emissions of pollutants from cars, lorries, boilers, furnaces and other sources are carried along by the wind, and whether they will be trapped near the ground, or borne aloft, or indeed brought towards the ground in downdraughts or in rain. Dispersion models used to forecast air quality can be set up to use the winds, temperatures, rainfall and other meteorological quantities directly from the computer models for weather forecasting (numerical weather prediction); they can therefore use the best available numerical information about the forthcoming weather. A dispersion model can combine the contributions from large numbers of sources which are in different locations, may have different emission rates, their own chimney heights or vehicle speeds, to estimate their resulting air pollution at a place. Such models can also be set up to model the formation and removal of species by chemical reactions in the atmosphere.

Q: *What pollutants?*

A: The pollutants of interest for air quality forecasts come from the same list as in the UK National Air Quality Strategy, especially nitrogen dioxide, sulphur dioxide and ozone. There is also much interest in fine particulate matter, such as PM₁₀, but this has a number of causes and requires further research.

Q: *How are air pollution forecasts used in the Department of the Environment, Transport and the Regions' Air Quality Bulletin system?*

A: The preparation of the Bulletin forecasts is in stages; first at the Met Office, and then at NETCEN (AEA Technology):

- **Pollution Forecast:** the concentrations of a short list of chosen pollutants are first calculated from their likely rates of emission, along with the expected rates of mixing in the atmosphere. The mixing depends on the forecast meteorological variables like windspeed. Dispersion models are used to generate the tables of concentrations at a number of locations for the coming period (e.g. tomorrow).
- **Forecast Banding:** the concentrations are then assessed in the light of past experience in looking at

measurements of air pollution, the prevailing weather, and then placed into bandings. The bandings represent the degree of risk for each pollutant. The concentration range that falls into a given banding (e.g. 'poor') varies with each pollutant. This is because individual pollutants affect the body in different ways.

- *Communication:* various media are used for communication, including warnings added to the weather forecasts on radio and TV as needed, bulletins on Ceefax, recorded telephone messages (freephone 0800 556677), and the Internet (see below).

Q: *Is the method of forecasting pollution episodes always the same?*

A: It is necessary to run different types of model. This is so that the characteristics of each pollutant can be considered. For example,

- *summer ozone:* chemical trajectory model has to model chemical reactions;
- *winter nitrogen dioxide:* urban box model has to represent the build up of pollutants from sources near the ground in stagnant air;
- *sulphur dioxide:* the long range transport model (e.g. NAME) has to describe emissions from large point sources across Europe, their plume rise, dispersion, chemistry and deposition.

The UK National Air Quality Strategy also has to consider each pollutant separately, because of their differing characters.

Q: *What factors determine the accuracy of air quality predictions?*

A: The accuracy of air quality forecasts and projections varies with the emissions and on the dispersion, so it depends on:

- emission sources, e.g. what is tomorrow's traffic?
- meteorological data, e.g. what will the weather do?
- height of plume, e.g. is it likely to be brought to the ground?
- plume trajectory, e.g. where will it go?
- rate of dispersion, e.g. is the rate of mixing properly modelled?
- chemical reactions, e.g. are all the important reactions included?
- removal by wet/dry deposition, e.g. how much might cloud and rain remove.

Q: *If monitoring data are available, is anything further to be gained through modelling?*

A: Dispersion modelling is a means of bringing emissions data, meteorological data and monitoring data together to provide the best possible insights into past episodes and future trends in air quality. To do this, the emissions sources, meteorological data, and receptor positions, are fed into the model. Then the model results are compared with

measurements, e.g. by means of a scatter plot, time series plot, and by statistical comparisons. Various averages such as daily means, seasonal or annual means can be useful in such comparisons. When comparing calculations and monitoring results for one hour averages, a lot of scatter is often found. The scatter may obscure the underlying trend in some data sets.

The great value of bringing model and monitor results together for comparison is that some measure of the model performance can be obtained. This is useful when trying to apply the model to give values at other sites where no monitoring has been carried out. It also acts as a validation check on the accuracy of the modelling process. A validated model could make the best possible use of emissions and meteorological data to provide spatial mapping of likely pollution, and trends towards 2005 AD. The validations will give insights into the confidence limits to be assigned to such maps and trends. Modelling can be applied at many locations, whilst monitoring is usually very restricted in terms of number of sites covered.

Q: *Where is air quality information on the Internet?*

A: At present the main sources include data as well as models:

- DETR:
<http://www.open.gov.uk/doe/doehome.htm>
- NETCEN, AEA Technology:
<http://www.aeat.co.uk/products/centres/netcen/airqual/welcome.html>
- Met Office
<http://www.meto.gov.uk>
- US EPA:
<http://tnwww.rtpnc.epa.gov>
<http://tnftp.rtpnc.epa.gov>
<http://tnbbs.rtpnc.epa.gov>

If you retrieve the files onto a computer, note that some files are compressed and need to be expanded again before they can be used. As a clue, the three letters **zip** often suggest you might try a program **pkunzip**. Manuals (once decompressed) might be in word processor format, like **wpf** for WordPerfect or **doc** for Word. Files denoted **exe** are usually in a machine readable form that will (hopefully) run on your computer as a program straightaway (once decompressed), whereas **for** denotes a Fortran program that has to be compiled before it will run. The advantage of the Fortran version is that you can read it, and work out exactly what the program is doing.

Q: *Where can I obtain the Met Office street canyon screening model AEOLIUS?*

A: By looking on the Met Office Internet site (above). Click on Weather Services and look for Environment. Then select AEOLIUS or street canyon modelling. The program can be downloaded without charge. The screen explains

what to do. The files retrieved will include AEOLIUS Screen and AEOLIUSF Full in compiled form ready to run on most PCs. There is a 'ReadMe' file (denoted **rme**) to explain the files that are downloaded. Documentation on how to run the programs is also given.

Q: *Can I use a dispersion model in declaring an air quality management area?*

A: The model is just one of several tools that will be needed to identify where Objectives might not be attained in the future. Declaring a non-attainment area will probably have many implications for planning and resources, as well as the public's involvement. Such decisions will need to be well supported by documentary evidence. Modelling can provide some of the technical information but will not be sufficient on its own. Questions of uncertainties in the data as well as in the modelling will have to be pondered. The model can be very helpful when used with other material, such as historical monitoring data. There is not enough experience yet to know exactly how such areas might be declared.

Q: *What about mapping quantities in the Strategy?*

A: Where there are a lot of monitoring sites, contours or shaded squares might be interpolated: the third report on London's air quality (SEIPH, 1996) discussed contouring techniques. Contours might be estimated from projected emissions data for 2005 AD as in the report by QUARG (1993). Models are a way of generating colourful plots for display purposes, but some thought is needed to choose the best variables (like long term averages) that will be plotted. What will the maps convey? Are they for traffic engineers, planners, environmental officers, councillors, or the public? Are contours or shading techniques most appropriate?

Q: *Can you summarise the steps in modelling that might be needed for mapping?*

A: The main steps are

1. decide whether the data to be modelled represent the recent past, current year, or future projections;
2. prepare emissions data, obtain meteorological data, decide on receptor layout;
3. put data into the formats demanded by the model so it can read the data;
4. run the model;
5. obtain running means, sequential means, annual means, percentiles, and percentiles of the running means, as defined for each pollutant in their Objectives in the Strategy;
6. map the results and indicate any areas that attain or do not attain the Objective(s).

Q: *Is there any need to validate a commercially available model after purchase?*

A: A model is validated by comparing its output with comparable measurements at the same place. A model depends on its inputs as much as on any inherent

assumptions that are within the model; validation of a model is therefore a test of the inputs as well as being a test of the model itself. Where measurements are available it is good practice to check the outputs; this will give the user a realistic feel for the validity of the work. Validation checks the complete system of emissions plus meteorology plus model.

Q: *Are there other questions that need to be considered?*

A: There are lots of considerations that enter into decisions about modelling and which cannot be answered here. The answers will be affected by local circumstances. Some key questions which have already been raised by colleagues in local authorities include:

- What pollutant(s) is to be modelled and for what purpose?
- What data are available for emissions, receptors, meteorology?
- Which model accepts these input data, is appropriate, affordable?
- Can the model generate the pollutant Objectives in the Strategy?
- How long will the model take to run on the expected amount of data?
- How will quantities in the Strategy be mapped?
- What map formats to use?
- What hardware is needed?
- What staff time is needed for training/data collection/modelling?
- How to use both model and monitor results to review and assess air quality?
- With whom should I collaborate in other internal departments, or in partner authorities?
- What can be done together in a local grouping or forum?
- How to work towards an inhouse capability?

Q: *Have you any other general comments?*

A: Yes, keep it simple! Remember emissions inventory and meteorological data must be compiled before modelling. The format of data depends on the model.

Aim to use the simplest nomogram methods (as diagrams, graphs, spreadsheets perhaps) first.

After a first assessment of any air pollution problem areas using monitoring data and simple methods, detailed computer modelling studies may be necessary. Large conurbations can expect to need the more elaborate systems because they have so many sources. They might skip the simple methods on this basis whilst still being consistent with Guidance.

Modelling will be influenced by local factors, extent of perceived problems, and resources. Use the monitoring data as well as the models for the best understanding of air quality in your locality.

Acknowledgements

During the First Phase trials, the Met Office was funded by Air and Environment Quality Division to assist local authorities in "dispersion models for local air quality management" under Contract EPG/1/3/81. We are grateful for this support. The author would like to state that most of the questions posed here were asked by colleagues from local authorities at some point during the Contract. Their thought provoking questions to the Advice Line are hereby acknowledged as the inspiration for this Discourse.

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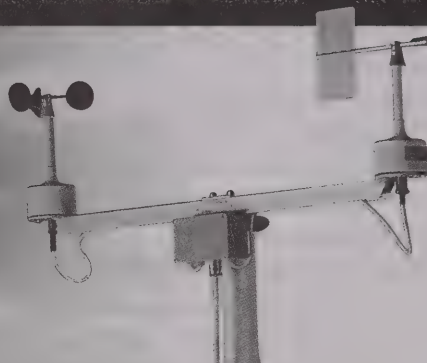
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NSCA NEWS & VIEWS

REGIONAL DEVELOPMENT AGENCIES

A Bill to establish Regional Development Agencies (RDAs) in England was announced in the Queen's Speech. The functions to be given to the Agencies would include promoting inward investment, helping small businesses and coordinating regional economic development. The Agencies would be expected to work in close cooperation with Government Offices for the Regions, the existing non-statutory Regional Chambers established by local authorities, the Training and Enterprise Councils and other bodies which promote economic development. The target date for the Agencies to come into operation is 1 April 1999. In June, the Government published an "issues" consultation paper, seeking views on issues such as the role and functions of RDAs, accountability and their structure and membership.

In its response NSCA expressed disappointment at the relatively low profile given to sustainable development and environmental protection issues. NSCA suggests that the concept of sustainable development should be central to the thinking of the new Agencies; if it is not, there is a real danger that they will simply promote an outdated and generally unsuccessful model of regional economic development which promotes infrastructure investment without adequate consideration of its environmental and social costs. If the Government is serious in its commitment to sustainable development, these issues should be placed (and be seen to be placed) at the very centre of regional policy. Sustainable development should not be seen as a footnote to economic development policy. Rather, the Government should be considering the establishment of Regional Sustainable Development Agencies.

INTEGRATED TRANSPORT POLICY

The Government is seeking views on the issues which it should be taking into account in the development of an integrated transport policy - a White Paper is expected next year. Such a policy would, the consultation paper says, include the development of better and more integrated public transport systems, more environmentally acceptable cars and car use, and more efficient and environmentally sustainable freight transport.

In an initial response to the consultation NSCA, while agreeing the need for a fundamental review of transport policy, said that this should not be an excuse for postponing action; if national air quality objectives are to be achieved by 2005, action is needed now. The Society urged the Government to set the pace with a number of "no regrets" policies which already enjoy widespread support, including:

- national traffic reduction targets;
- radical reform of transport taxation and employment perks;

- powers for local authorities to develop green commuter plans;
- encouragement of better public transport systems.

See also, Update - Transport & the Environment.

AIRPORTS AND THE ENVIRONMENT

NSCA has supported the recent joint statement from the Airports Policy Consortium and Transport 2000 which aims to improve the environmental performance of the aviation industry,

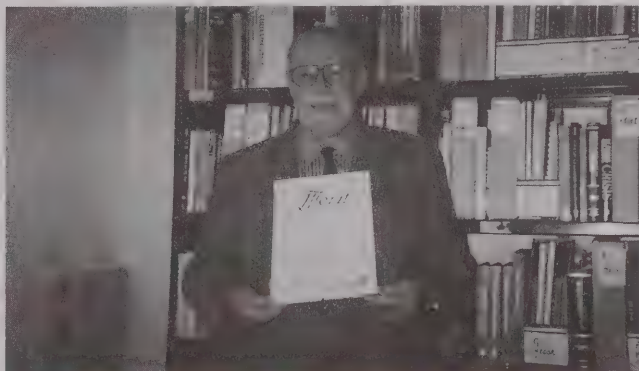
The statement urges local communities, as well as businesses, airport operators, airlines, the Government and the Civil Aviation Authority to work together to achieve a better future for the aviation industry. Government predictions suggest that the number of air passengers using the UK's airports is likely to double by the year 2015, taking the number of passengers to over 300 million. With this in mind the APC and Transport 2000 believe that a joint way forward in which the efforts of the aviation industry are united with those of local communities is crucial. In particular, the Government is urged to consider carefully the impact of airports and air travel alongside its work on an Integrated Transport Strategy.

The statement also calls upon the airports and airlines to develop strict environmental limits for impacts such as noise and pollution and to ensure that the environmental effects of airports and aviation can be openly monitored and subsequently contained.

Copies of the statement can be obtained from Karen Robinson at the Airports Policy Consortium, tel: 0181 541 9459.

LABOUR HONOURS LEN POOLE

NSCA congratulates vice-president Len Poole on the award of the Labour Party's prestigious Certificate of Merit - one of only two awarded annually. The award, for outstanding voluntary service to the Labour Party, was presented to Len by Prime Minister Tony Blair at the Party's recent annual conference, held in Brighton.



UPDATE

LAPC AND IPC APPEALS

As from 1 September 1997, the Secretary of State for the Environment, Transport and the Regions has delegated his powers to take decisions on LAPC and IPC appeals made under s.15 of the *Environmental Protection Act 1990* to the Planning Inspectorate. Appeals made under s.22 (confidentiality) will still be determined by the Secretary of State and he may also "recover" certain other cases for determination; these include

- cases involving processes or sites of major importance;
- cases giving rise to significant public controversy;
- cases which raise significant legal difficulties;
- cases which can only be decided in conjunction with other cases over which inspectors have no jurisdiction;
- cases which raise major or novel issues of industrial pollution control which could set a policy precedent, e.g. cases involving the use of new techniques;
- cases which exceptionally merit recovery because of the particular circumstances.

Appeals relating to waste management licences have been dealt with by the Planning Inspectorate since 1 April 1996, as have those relating to the registration of waste carriers.

ASSESSING POLLUTION RISK

The Environment Agency has recently introduced a new system for assessing the pollution risk from major industrial processes. *Operator and Pollution Risk Appraisal* (OPRA) is based on an analysis of the inherent level of environmental risk involved in a particular industrial process and the performance of the operator in managing that risk. It will provide Agency inspectors with a simple, objective and consistent assessment of the environmental risk from IPC processes in England and Wales.

Key features of the new system include:

- improved guidance on evaluating attributes of the operator's performance (e.g. maintenance, training and operation) and the process pollution risk (e.g. the presence of hazardous materials, scale and frequency of hazardous operations);
- a more systematic method for evaluating process pollution risk based on selecting a representative hazardous substance for the process; this will be the one with the highest environmental risk, but the other hazardous substances on the site must also be considered;

- recognition of the attainment of certified environmental management systems (ISO 14001 and EMAS);
- the pollution risk appraisal considers both the real risk of harm to the environment arising from hazardous chemicals, and the perceived risk due to offensive characteristics, such as visible or odorous emissions.

TRANSPORT & THE ENVIRONMENT

Launching the Royal Commission on Environmental Pollution's 20th report, its Chairman, Sir John Houghton, said that without major changes, the UK's transport problems could reach crisis point. He said that radical action was essential to make private transport less damaging and public transport more attractive.

The report says that the problem is not car ownership, but excessive dependence on using cars; however, there appears to be little evidence of effective measures to stop the growth in such dependence, or the resulting increases in congestion and environmental damage. The RCEP proposes a number of specific measures which will contribute substantially to a solution. However, bringing about a more sustainable transport system for both people and goods - adequate for the social, economic and leisure needs of the nation - will require action by all sections of the community.

The RCEP concludes that action is needed in the following areas:

- *Creation of an integrated transport system:* this will involve both central and local government; public transport will need to improve both in terms of reliability and quality with fares being competitive in relation to the cost of private transport; more investment needed in the railway system; and better planning by industry and greater use of local sourcing to reduce the distance over which goods are transported.
- *Cleaner and more efficient vehicles:* fuel consumption of cars must be reduced, if necessary by legislation and more information should be available to people on the fuel consumption of different vehicles and the amount of pollution they cause.
- *Incentives and market signals:* local authorities should be able to charge for road use and non-residential private parking; heavy goods vehicles of all nationalities using UK motorways should be required to purchase a permit, thus paying for wear and tear on the roads.

- *More effective institutions:* Transport and land-use planning must be planned together at all levels - national, regional, sub-regional and local; local authorities should be required to prepare and implement long-term integrated transport plans.

ROADSIDE EMISSIONS TESTING

Local authorities are to be given powers to check for compliance with prescribed vehicle emission standards (i.e. MOT etc standards) and to issue fixed penalty notices to those failing the test. They will also be able to issue fixed penalty notices to drivers of vehicles who, without good reason, leave engines running in parked vehicles.

Regulations to be made under the *Environment Act 1995* will initially apply only in seven volunteer local authority areas - Birmingham, Bristol, Canterbury, Glasgow and Westminster City Councils, Middlesbrough Borough Council and The City and County of Swansea. At the end of a 12 month trial period, the Regulations will be reviewed and, following further consultation, amended as required and the powers probably extended to all local authorities.

The fixed penalty for failing a roadside emission test has been set at £60 (rising to £90 if not paid within 28 days) and the penalty for leaving the vehicle engine running without reasonable cause will be £20 (rising to £40 if not paid within 28 days). Local authorities will be able to use income from fixed penalties to finance emissions enforcement work, though this will be reviewed after the 12 month trial period.

NEW ADDRESS

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WHO AIR QUALITY GUIDELINES

Since the first edition of the WHO's *Air Quality Guidelines for Europe* was published in 1987, new scientific data in the field of air pollution toxicology and epidemiology have emerged and there have been developments in risk assessment methodology. As a result WHO established a number of working groups to revise, amend and update the original Guidelines and these are to be published in a second edition of the WHO publication, which is expected towards the end of 1997. Among their recommendations are the following (with averaging times in brackets):

- *carbon monoxide:* 100 mg/m³ (15 min); 60 mg/m³ (30 min); 30 mg/m³ (1 hour); 10 mg/m³ (8 hour).
- *ozone:* 120 µg/m³ (8 hour).
- *nitrogen dioxide:* 200 µg/m³ (1 hour); 40 µg/m³ (annual).
- *sulphur dioxide:* 500 µg/m³ (10 min); 125 µg/m³ (24 hour); 50 µg/m³ (annual).
- *particulate matter:* available epidemiological data does not facilitate establishment of a level below which no effect would be expected; exposure-effect information to be provided which will give guidance to risk managers about the major health impacts for short and long term exposures at various levels.

Correction - *Clean Air*, Vol. 27, No. 5 (September/October 1997)

Page 145, Environmental Statistics - The Global Atmosphere: emissions of methane in 1995 totalled 3.8 thousand tonnes (not 3.8 million tonnes).

MEMBERS NEWS

Members! Are we covering your news? Please check that your press office has *Clean Air* on its mailing list.

Tameside MBC is celebrating the end of the long-running legal action against the notorious Smith Brothers factory in Hyde for breaches of its authorisation under the *Environmental Protection Act*. The company withdrew their appeal at the last moment, and paid Tameside's legal costs of £5,000. More importantly, this means that fines and costs totalling £237,000 previously awarded against the company now stand. Cllr Frank Robinson reassured local residents that continuing problems with odour from the plant will be met by further action from the Council.

Tesco are replacing conventional diesel with City Diesel at all their filling stations within the M25. Although it costs more to produce than ordinary diesel, Tesco say they will not pass the cost on to customers, so it will be available at the same price as conventional diesel. Meanwhile, shoppers who cycle to the Chichester branch of Tesco are being offered the loan of trailers to tow their groceries back home. For £5 they can buy a special fitting which allows the "bike-hods" to be attached. If the idea catches on, Tesco will extend the idea to other stores.

"Navigating with Nature" is the title of a project and information leaflet promoting the responsible use of recreational craft for the protection of the environment. It has been produced by the **UK Centre for Economic and Environmental Development**, following a successful trial in the Poole Harbour area last year. Information from Catherine Saunders at UKCEED on 01223 367799.

Johnson Matthey has opened a new diesel emission testing facility at its European Autocatalyst Technology Centre in Hertfordshire. The testbed (shown below) will allow the measurement of particulates, hydrocarbons and NOx from diesel cars and vans.



Sheffield City Council is running a project on behalf of the European Commission drawing together Europe-wide good practice in air quality management. Information is available on the Council's website on www.sheffielddeps.demon.co.uk

High demand for courses on gaseous and particulate monitoring has led the **CRE Group** to expand its training programme. Four courses on standard measurement techniques will be held over the next year, plus a new two-day course on ambient monitoring. Details on 01242 673361.

Leeds City Council is the latest authority to join the dash for gas - this time a CNG-powered refuse collection vehicle. Lord Mayor of Leeds, Cllr Linda Middleton is pictured at the wheel. According to Steve Currey of **British Gas** there are now 33 local authorities and 54 other organisations using natural gas vehicles.



Divisional News

Paul Cooney is to be the **South East Division's** representative on the new Board of Trustees. Other elections to NSCA Council are: Ron Barnes, Joe Beagle, Simon Hickmott, Brian Marsh, Mike Schwar and John Smith, with John Rice and George Vulkan as substitutes. Forthcoming meetings on 10 February 1998 and 19 May (AGM).

Our apologies for omitting coverage of **West Midlands Division** activities in the last *Clean Air* due to an editorial slip. We should have recorded the retirement of Cllr Bill Hancox as Chairman of the Division. The AGM also heard from Paul Cooney on NSCA restructuring, and from Nick Powell and Helen Mahan on the Dudley Environmental Service for SMEs. Phil Adams, Graham Colling, Steve Norman and Christopher Fry were appointed to NSCA

Council. Steve Norman has subsequently been appointed as the Division's representative to the Board of Trustees.

More recently the Division visited the historic Ironbridge Gorge, including the Coalbrookdale Museum of Iron and the Aga Rayburn Foundry. It was here that Abraham Darby first smelted iron using coke, but members were assured that the current foundry is fully compliant with the provisions of the *Environmental Protection Act*! The next meeting on 11 December will be hosted by Aspinwall & Co near Shrewsbury, with a range of presentations on IPPC, Contaminated Land, the Air Quality Strategy and Producer Responsibility for Waste.

The **Scottish Division** is holding its AGM on the morning of Thursday 19 February. This will be combined with an afternoon seminar on contaminated land.

Elsewhere...

Someone in the **Environment Agency** press office has an eye for a daft story. *Clean Air* was invited to a photo-opportunity involving the release of 500 painted cucumbers into Lancashire rivers. The Agency is trying to track down the source of sheep faeces which turn up on Blackpool beach, and says that cucumbers closely resemble the droppings in terms of shape, buoyancy and biodegradability. All we can say is, next time you have a meeting with the Agency, look carefully inside the sandwiches.

New Scientist reports that the latest alternative fuel for cars, now being tested in the US, is **liquid nitrogen**. The liquid vaporises at ambient temperatures and can drive pistons just like a steam engine. Just two problems: the car needs a 100-gallon pressurised tank, and the evaporator keeps freezing up, leading to a new vehicle-related health threat - frostbite.

The **RAC** is also keen on alternative forms of transport. On the first day of the Labour Party Conference in Brighton an RAC airship flew relentlessly up and down the seafront. We could see it from our third-floor NSCA offices but thanks to a low-level sea mist it remained invisible to the delegates outside the conference centre, who must have

been puzzled by a mysterious droning noise in the fog overhead. Fortunately the weather cleared on the following day and the blimp reappeared for all to see.

The latest edition of *Acoustics Bulletin* carries an article called **The Effect of Disco Noise on Sharks**. It's a serious piece of work; noise consultant Philip Dunbavin describes how he was called in to investigate whether the noise from a proposed disco in Blackpool would affect the shark tank in a neighbouring aquarium. On-site testing, combined with reference to some obscure marine biology research papers led him to the conclusion that the sharks would remain unaffected.

Are you an ecologically conscious person? If so, you are "...now able to constructively contribute to the reduction of pollution by the 'pre-need' purchase of this environmentally friendly product, thereby ensuring your final and inevitable journey is in keeping with your life's principle of environmental protection..." Yes, it's a **flat-pack biodegradable cardboard coffin**. The press release cheerfully observes that it will appeal to "...green disciplines, charities, hospitals, missionaries, armed forces, war zones, disaster areas etc, as well as established funeral directors..." Order yours from Celtic Caskets on 01283 815992.

What happens to the huge amount of smuggled **alcohol and tobacco** confiscated by HM Customs each year? Their Environmental Policy Manager John Cole revealed all in a recent letter to the Guardian: "...All the packaging...is mechanically recovered and sold as raw material. Beer and wine is processed into a component of animal feed, whilst spirit may be returned to UK producers or reprocessed into industrial alcohol; at present this is over 80 tonnes a week. All tobacco is destroyed by incineration and, where practicable, generating electricity from the waste stream..." What inspires this high degree of environmental responsibility? Mr Cole adds: "...As the department responsible for collecting the landfill tax we do what we can not to contribute unduly to it."

NSCA Divisional Meetings

Information about these events is available from Divisional Secretaries. Contact numbers are on page 154.

East Midlands

- 20 November: Visit to Coalite Chemicals, Bolsover
- 12 February: Divisional Council Meeting, Kelham Hall
- 26 February: Visit to British Geological Survey
- 4 June: Divisional Council Meeting, Kelham Hall
- 1 October: Divisional Council Meeting, Kelham Hall

Scottish Division

19 February: AGM, seminar on contaminated land

West Midlands

11 December: Meeting on IPPC, Contaminated Land, the Air Quality Strategy and Producer Responsibility for Waste, at Aspinwall & Co, Shrewsbury

South East

- 10 February: Divisional Meeting
- 19 May: AGM

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FORTHCOMING NSCA EVENTS

Tuesday 10 February 1998

Training Seminar - NEC Birmingham
Implementing Air Quality Management

Thursday 26 - Friday 27 March 1998

Spring Workshop - Abingdon
Air Quality Review and Assessment

Tuesday 16 June 1998

Training Seminar - NEC Birmingham
**Effective Transport Measures for
Air Quality Management**

Tuesday 15 September 1998

Training Seminar - NEC Birmingham
Noise Update 98

Monday 26 - Thursday 29 October 1998

Weston-super-Mare
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For list of forthcoming
Divisional meetings and events see page 183.

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